Special Report 12

Americans on Target: U.S. Army Tank Gunnery Excellence Canadian Army Trophy Competition 1987

John S. Caldwell, Jr.

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for the Behavioral and Social Sciences

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The Canadian Army Trophy (CAT) competition is a biennial tank gunnery contest organized and administered by Headquarters, Allied Forces Central Europe. The preparation for CAT is intense in that the prestige of Armies and equipment often rides on the outcome. It involves the selection and assignment of personnel, optimum use of unique capabilities of equipment an effective utilization of training resources. Thus the methods used to prepare for CAT, while not directly applicable to similar situations in the day-to-day Army, do result in successes and failures that indicate possibilities for positive change in doctrine and equipment.

This report reviews the preparation and conduct of U.S. participation in CAT during 1987. It presents these activities against a background of previous competitions and some of the ac tivities of other countries. The writer, a participant in one of the CAT units, attempts to provide this information in a format that would aid in determining possible improvements to doctrine and equipment. In-so-far as parallels may be drawn between the conditions obtaining during the CAT competition and those of pre-combat or combat situations the information shoul be useful to personnel specialists, training developers, and equipment developers.

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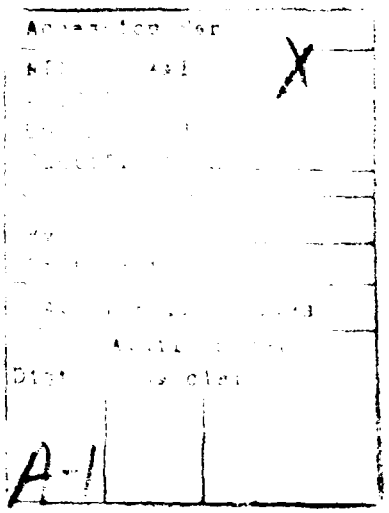

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John S. Caldwell, Jr.

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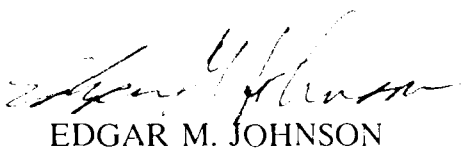
FOREWORD

The Army Research Institute maintains a program of research in Armor personnel performance and training issues and continually seeks information that would assist in the derivation of problem areas or indicate promising techniques. As a crucible of concentrated personnel and training activity the Canadian Army Trophy (CAT) competition provides a unique opportunity to study the results of different approaches and methods for personnel selection, assignment and training. The results of this competition do not lend themselves to experimental analysis. Small numbers of units and personnel are involved; variations in techniques occur randomly within units; and the final performance measure, CAT score, is restricted in range. Thus, analyses of the competition events have been restricted to piecemeal statistics from which subjective reviews can be attempted and observations by researchers participating in the event. ARI has previously published two such reports on CAT 85 and CAT 87. This report adds to that body of subjective information.

The report differs from previous publications in that it was written by a military participant in one of the units participating in CAT 1987. The report provides much more detailed procedural information than would be available to an outside observer and a firmer basis for subjective evaluation of the different techniques. The writer has provided his own interpretation but the reader is provided the information to form his own conclusions. And while the writers style may at times be considered biased by his personal involvement, zeal, or fervent patriotism, his evaluations of procedures are well worth consideration.

The contents of this report have been disseminated to many of the participants in CAT 87 and CAT 89. The report has also been provided to Army departments responsible for personnel and training policies and to the materiel development community. It is published to provide wider consideration within the personnel and training community.



EDGAR M. JOHNSON
Technical Director

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Canadian Army Trophy Competition--1987

John S. Caldwell, Jr.
Lieutenant Colonel, Armor
U.S. Army

- Words of Winners -
Canadian Army Trophy (CAT) Competition
1987

"We saw the opportunity there, and we said-- we've got to do it. We could taste it. Every time we went down range we acted like it was the real thing...We all wanted it so bad. It was there and within reach-- and we weren't going to let it go."[1]

PFC Steven Kuhn
Driver, D14, 4-8 Cavalry
CAT '87

"It's kind of hard to [explain]-- the feeling when they said we had won. My brain just went elsewhere for a second. Then I thought--we actually won. It still blows me away... I just couldn't believe it. I had tears in my eyes. It was a great feeling. I felt like we'd won the Olympics or something. That's what I would equate it to."[2]

PFC Brent Berry
Driver, D12, 4-8 Cavalry
CAT '87

"That's what makes America--people reaching down and pulling out what they have when they need it."[3]

SSG James Traxler
Tank Commander, D23, 4-8 Cavalry
CAT '87

Preface

In June 1987, an American tank platoon seized the top spot in the Canadian Army Trophy (CAT) tank gunnery competition for the first time in the 24 year history of the NATO contest. With a margin of victory of only a few seconds, that platoon -- First Platoon, D Company, 4-8 Cavalry, 3rd Armored Division, bettered a near perfect performance by the recently dominant Germans and deadly accurate shooting by other American, Belgian, British, Canadian, Dutch and German platoons.

Those precious few seconds that won the American victory, earned in a year of intense preparation, will ignite a new round of friendly competition among NATO's armored units. This competition will advance the state-of-the art in tank gunnery, tank design and maintenance, and crew and unit training. The new levels of excellence achieved through this competition -- once they are spread beyond the competing units -- can serve to strengthen the conventional ground forces of NATO at exactly the time their deterrent role may grow in significance.

I am writing this paper to tell the comprehensive CAT story -- one far broader than those found in competitors' after action reports. I cover what CAT is and why it is important for the U.S. Army to compete and win, what it takes to win, what are the rewards, and my view of how tank training and competition should develop in the future. This paper takes an in-depth look at the evolution of this intense and significant, but little-publicized competition, in order to generate an appreciation for that intensity and significance.

I present first hand insight into many of the key issues, constraints and decisions faced by the American teams on their way to CAT '87. In some cases, I examine the details of the CAT '87 results and the key features of the winner's program (especially training) and compare them with other American team programs in order to determine the factors that made a difference -- that produced the winning margin. The personal views of several CAT '87 winning soldiers enrich the paper. At the conclusion, I give my views of the current and potential benefits of the CAT competition -- and project the direction the competitior should go in the future to increase these benefits.

My target audience is far broader than the CAT competitors -- past and future -- although this work should be of immediate interest and value to them. The audience I am really trying to convert is the top leadership of the U.S. Army -- our generals that can influence the training and support of our troops in the field and the materiel acquisition process that equips them. They need to know about the competition -- what it takes to win, the risks, the costs, and the pay-offs. Then, through vision and innovation, much as has been accomplished at the National Training Center for maneuver warfare, we can extend the levels of excellence achieved by the American competitors in CAT '87 and strengthen the U.S. Army and our alliances.

Because my purpose for writing this paper is multi-faceted, and because my target audience is broad, I provide this guide for reading the paper.

The first section of the paper, **"Introduction and CAT Background"**, *contains two chapters.* **Chapter 1 - Warning to the Warsaw Pact,** issues a strong warning to the Warsaw Pact not to test the lethality of NATO's tank forces and thus places CAT in what I believe to be its proper context, that is, a competitive proving ground to develop and demonstrate improved combat capabilities. **Chapter 2 - The "Lives" of CAT,** traces the evolution of the CAT competition, discusses some of the trends, spotlights some of the public fallout at home and abroad, and features a narration of the winning American battlerun. *All should read these two chapters.*

The next section, **"Building a CAT Winner"**, is somewhat like an after-action report and contains four chapters. **Chapter 3 - The Baseline: CAT '87 Results,** examines the results of CAT '87 to establish the basis for comparing the programs of the American teams. **Chapter 4 - Manning a CAT Winner,** gives insights into the competing American units and describes their CAT team personnel selection procedures. Each was a little different, and reflected the special constraints facing each unit commander and his solutions. **Chapter 5 - Training a CAT Winner,** covers the major features of the team training programs. This is a key chapter and it discloses the tremendous training resource requirements and the disparities among the units. It also features the story of how Simulation Networking (SIMNET) was diverted to support the American teams' preparations for CAT '87. It is a story of innovation inspired by competition that rivals any documented in In Search of

Excellence , and should be of interest to Army leaders. **Chapter 6 - Equipping and Supporting a CAT Winner,** summarizes the key equipment and support factors and describes how each unit addressed them. These chapters will be most valuable to those seeking lessons-learned in preparation for future CAT competitions. The final section, **"Where Do We Go from Here?"**, embodies my major purposes for writing this paper and contains two chapters. **Chapter 7 - The Benefits of CAT,** gives my evaluation of the current benefits the U.S. Army and the NATO alliance is gaining from the CAT competition. **Chapter 8 - Future CATs: Challenges and Pay-offs,** presents my views on how the competition should evolve -- that is, become more oriented on combat-like tasks in order to substantially increase the return on our huge investment in the competition. Our generals should read these chapters and work to implement the ideas that have merit. Finally, the **Bibliography** is extensive, and should prove valuable to those interested in winning CAT again.

I believe my roles in CAT '87 and in developing the M-1 Abrams tank give me a unique perspective from which to write this analysis. As Commander of 2-66 Armor Regiment from July 1985 - June 1987, I actively supervised the organization of the battalion to train and support two of its tank companies to prepare for the competition. D/2-66 Armor was randomly selected to compete. Our organization and training program produced excellent results -- but not good enough to win. First hand knowledge of our strengths and weaknesses does give me a powerful tool for analysis of other programs. I personally witnessed nearly every CAT '87 battle run, the excitement of the contest, and the awesome display of deadly skill of the free world's best tank soldiers. As a research and development coordinator for the Project Manager of the M-1 Abrams tank from August 1980-July 1983, I was deeply involved in the development, production, testing, fixing and fielding of the tank's turbine engine and power train.

Those early times were dark ones for the Abrams tank, as its critics gained an initial upper hand with claims that it was nothing more than an expensive "lemon" that spewed flames from its jet engine and then broke down every 43 miles. The credibility of the Army's leadership was openly questioned over the acquisition of this "inferior" tank. The program barely survived. But how wrong the critics were! As I watched the American platoons from the 3rd Armored Division, the 3rd Infantry Division and the 2nd Armored

Division (Forward) employ the Abrams with such skill and reliability in CAT '87, my chest swelled with pride. I realized I had grown with and helped deliver this tank from the factory floors of Connecticut, Michigan and Ohio, to the dusty, muddy testing fields of Fort Hood and Fort Knox, to our forward deployed troops facing freedom's enemies in Europe, to the winner's circle of the most prestigious tank gunnery competition in the world.

This research paper was prepared while the American celebration of its CAT '87 victory was in full swing and, in part, is intended to "wave the American flag" and glorify the American soldier. After all, American tax payers have invested billions of dollars in their tank forces and deserve to see a return on their investment. But I do not want this important theme diminished -- the Belgian, British, Canadian, Dutch and German competing teams were highly skilled and professional. Some, equipped with older model tanks, even outperformed some American and German platoons equipped with advanced M-1's and Leopard 2's. We trained with them and competed against them in preparation for CAT '87. Their skills set the standard to beat in 1987, and they will be very difficult to beat in CAT 1989. They are our allies, and their well equipped and highly trained soldiers will be on our flanks to defeat any Warsaw Pact ground attack into Western Europe.

This work is dedicated to the many committed people, soldiers and civilians, who put the Abrams tank into the hands of American soldiers and trained them to use it in the defense of freedom as well as to win CAT '87. Special recognition goes to the late Major General Duard D. Ball, who served as the Program Manager from July 1980 - July 1983 and guided the program thru its darkest days.

John S. Caldwell, Jr.
Lieutenant Colonel, USA
Author

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[1] From transcripts of personal interviews conducted by Soldier's Radio and Television, February 1988.
[2] Ibid.
[3] Ibid.

Introduction
and
Competition Background

Chapter 1

Warning to the Warsaw Pact:

If you make the decision to attack NATO ground forces in Western Europe, the most highly skilled, best equipped and supported armored forces in the world will cut you to ribbons. You may attack in great mass and obscure the battlefield with smoke and artillery, but your tank and motorized rifle companies will meet face-to-face with platoons that will acquire them at great ranges under the most adverse conditions, hit their armored vehicles more than 90 per cent of the time with first shots, and kill them in less than 10 seconds per shot. We can kill you from stationary protected battle positions or we can counterattack you with blazing speed and hit you with little or no loss of accuracy. It makes no difference to us whether you are moving or not. Our fire controls make your tanks and BMPs (Soviet personnel carriers) easy prey for our gunners. If you decide to slow your attack to dismount your infantry for close in protection of your armor, your losses will mount faster. Our tank crews, on the move with their stabilized coaxial machine-guns and thermal sights, have the capability to acquire and kill nearly 100 per cent of the troops they face. You will not be able to find a significant weakness because this capability exists across the allied front in all the armies.

These tank gunnery skills and capabilities have been developed over the years and demonstrated in the Canadian Army Trophy competition every two years. After each competition, the Americans, Belgians, British, Canadians , Dutch and Germans carefully study the results, consult with industry and their best tankers, initiate improvement programs, and renew their determination to improve their combat capabilities and win the next CAT.

The maneuver and war-fighting skills of the NATO ground forces have been developed largely by the U.S. Army at its National Training Center in Fort Irwin, California. There, its heavy battalions have "competed" against your battle formations and doctrine under

the most stressful combat-like conditions. Armed with valuable lessons and experience from the National Training Center, the U.S. Army has significantly strengthened the NATO alliance in numerous combined maneuvers.

We, the American victors in the 1987 Canadian Army Trophy competition, issue this warning on behalf of our allies and from a position of strength. The U.S. Army assembled the right combination of team building skills, modern tanks, top quality soldiers, training techniques and resources, maintenance capabilities, industry support, and chain-of-command (top to bottom) commitment to the excellence required to win. This same formula has strengthened our forces as the cornerstone of the NATO alliance.

We Americans won because one of our tank platoons scored slightly higher than a crack German platoon-- with a nearly perfect score -- and defeated the remainder of the field of very proficient American, Belgian, British, Canadian, Dutch, and German platoons. But take no comfort in the American victory, for if you will examine the results closely, you will find a very high level of performance by all competitors and only a small difference between the highest and the lowest teams. Nearly all teams performed better against higher standards than in previous contests. So, it is a fact that the competition is producing winners that are setting newer and higher gunnery standards every contest.

The loser in CAT '87 and future Canadian Army Trophy competitions is you, the Warsaw Pact! The leadership of the Allied armies has long recognized the value of CAT competition as a development tool, and will continue to drive contest standards to meet or exceed realistic combat conditions, increase levels of performance and spread the improvements throughout their armies -- thus widening the combat capabilities gap between your forces and ours.

This warning, as presented here, serves two purposes. First, it places the Canadian Army Trophy competition in what I believe to be its proper context. That is, a competitive proving ground for the development and demonstration of allied combat gunnery skills. The "heat" of international competition can unlock true innovation that will push the limits of performance and set the standard for the rest

of the "non-CAT" force. Second, it projects a position of relative allied military strength versus the Warsaw Pact that does not fully exist today -- but could exist in the future, if the NATO allies continue heavy investments in force modernization, efforts such as the CAT competition, and the U.S. Army's National Training Center.

Chapter 2

The "Lives" of CAT

The Canadian Army Trophy (CAT) competition is the most demanding and the most prestigious tank gunnery contest in the free world. Target acquisition, accuracy and engagement time standards far exceed national training standards. Even a respectable showing requires a year of intense preparation of men and equipment. A tank company cannot win CAT without a specific high priority commitment from its Army's leadership and a shifting of substantial personnel, equipment, support, and training resources to reinforce the effort. It is the "major leagues", and those participants who fail to realize this will see their failures and their military credibility questioned in major newspapers. The winning soldiers carry away experience, enhanced reputations, skill and awards that will serve as building blocks for successful careers. Their units gain lasting reputations among the free world's armored forces. The tank and supporting equipment manufacturers advertise their wares as the best in the world--and often reap the profits accordingly. The training program is long and grueling for the contestants--the winners and the others. Consequently, CAT may have positive or negative effects--and the effects can be substantial and lasting.

"Unless you're in the Armor and you know about it, it's no big deal. But it's the biggest thing I ever will attempt for the Army."[1]

PFC Steven Kuhn
Driver, D14, 4-8 Cavalry
CAT '87

The Purposes for CAT

The Canadian Army Trophy competition is organized and administered by Headquarters, Allied Forces Central Europe (AFCENT). The major organizational players are the Northern Army Group (NORTHAG) and the Central Army Group (CENTAG). The competition began in 1963 with twin purposes-- **improve the overall standards of tank gunnery in NATO** and to **promote comradeship and fraternity among the competing forces.** At that time, the Canadian Government donated a silver replica of a Centurion tank (now known as the Canadian Army Trophy) to be awarded to the country earning the highest tank gunnery score.[2]

The awarding of the trophy for the highest gunnery results has skewed the emphasis to the first purpose (tank gunnery improvement) because it is measurable, visible, and vital. Above all, the combat effectiveness of a tank and its crew is judged ultimately by its efficiency in killing enemy tanks and soldiers. Although there has not been any reduction of emphasis on tank gunnery improvement, in recent years there has been a recognition of the growing significance of the second purpose (close allied relations). Tanks kill tanks, but the next war in Europe will be fought by an alliance, and the outcome will depend upon the NATO members' capability to merge their national resources and focus them against a common enemy. The recent (beginning in 1983) awarding of the trophy to the high scoring Army Group (composed of multiple national teams), combined with an ever increasing demand throughout Europe for limited tank training ranges, has both facilitated and forced selected cooperation and joint training events among the CAT competitors. This is a very positive trend that is likely to increase and spread far beyond the CAT competitors. Even so, everyone, especially the Americans, will notice the colors and bumper markings of the winning CAT platoon!

"The biggest factor was certainly that America had never won it and I determined America was going to win it. I wanted America to take it, one way or another--and it would be damn nice if my platoon could take it."[3]

SGT Shaun Banks
Driver, D11, 4-8 Cavalry
CAT '87

A Review of the Competition

The rankings of winners throughout the history of the Canadian Army Trophy competition are generally accepted, but some might argue about them, as the criteria for declaring each contest winner have not always been the same (see Figure 1).[4] In the earlier contests the national winner was determined by adding the cumulative scores of its firing units. In recent years, the national rankings and "bragging rights" have been determined by the score of the highest shooting national tank platoon, while the trophy has been awarded to the Army Group with the highest cumulative firing score.

CAT Competition Results: 1963-1987

	Belgium	Canada	Germany	G. Britain	Dutch	USA
1963	1	4	2	5	3	-
1964	1(tie)	5	1(tie)	3	4	-
1965	2	3	5	1	4	-
1966	2	4	3	1	5	-
1967	3	1	4	2	5	-
1968	1	5	2	3	4	-
1970	-	3	2	1	-	-
1973	-	-	1	2	3	-
1975	3	-	1	2	-	-
1977	3	1	2	4	5	6
1979	2	5	1	3	-	4
1981	2	4	1	5	6	3
1983 *	4	3	1	5	-	2
1985 *	4	6	1	5	3	2
1987 *	5	4	2	6	3	1

* Trophy to winning Army Group: 1983 CENTAG
1985 NORTHAG
1987 CENTAG

CENTAG Team: Canada, Germany, USA
NORTHAG Team: Belgium, Dutch, Germany, G. Britain, USA

Figure 1.

Underlying these results are some significant factors and issues-- some subtle, some not so subtle-- that have influenced the standings and trends in performance. The early strong performance by the Belgians persisted until the 1980's. The Belgians are still equipped with the older German Leopard 1 tank. The Germans have consistently given a strong performance for the duration of the contest, virtually dominating the competition in the 1980s (six wins, never lower than 2nd place). The German forces are equipped with a mixture of German Leopard 1 and Leopard 2 tanks, but the winning teams have been equipped with Leopard 2's since 1981. The British team performance is in general deterioration after years of successful finishes. British teams have been equipped with British Chieftains until CAT '87, when the new British Challenger made its debut. During the steady improvement of the American teams, culminating with a win in CAT '87, at least part of the American competitors have been equipped with the American M-1 Abrams tank beginning with CAT '83 . For CAT '87 , all American teams had M-1's or M-1 variants.

The competition has evolved over the years as the tanks, supporting equipment, training techniques and devices, soldiers and threat have become ever more capable. Throughout the evolution, often with fierce, preliminary, administrative infighting among the participants over rules and conditions, CAT has served its original purposes very well. This evolution works to our benefit as long as it continues to push the state-of-the-art of combat capabilities, and does not depart from the promotion of partnership and cooperation among the NATO Allies.

CAT: 1963-1981 [5]

From the start, Headquarters, Allied Forces Central Europe (AFCENT) acted as the executive agent for Canada, conducting the competition. A Committee of Control , chaired by an AFCENT General Officer with representation from each competing nation , Northern Army Group, Central Army Group and the Canadian Ministry of Defense, was established to formulate and issue the rules and conditions for each competition. This organization has endured through 1987, and the power and influence of the committee of control on the outcome of the contest cannot be overstated. The committee controls

almost every aspect and detail of the competition--down to and including target size and ranges, firing order, crew eligibility rules, team selection criteria, firing unit organization, training resources and many others. The bottom line--rules and conditions clearly favorable to any one national team are unlikely to survive a vote.

The early CATs were relatively simple contests. The national teams, comprised of varying numbers of tank platoons organized according to national standards, formed groups of single tanks along a firing line and engaged stationary targets. The contest progressed to single tanks moving along a course road engaging stationary targets. By 1968, the complexity and costs had risen to the extent that the decision was made to hold the competition bi-annually. By 1981, the competing unit was a three-tank platoon negotiating a platoon battle run firing while on the move and stationary at 18 main gun targets, both moving and stationary, and 60 stationary troop targets. Thirty main gun and 750 machine-gun rounds were permitted.

When the United States first entered CAT in 1977, it was initiated into a new world of tank gunnery and finished dead last by a substantial margin. The US team showed only marginal improvement in CAT '79 with a next-to-last finish. However, some significant issues (see Figure 2.) influencing these outcomes do not show up in the "box score." These issues -- discussed not to offer excuses for poor performance -- give some insight into the nuances of the competition.

ENDURING CAT ISSUES
(Subtle but Substantial)

- **Location/ Control of Competition Range**
- **Competing Teams' Organization**
- **Team Selection Methodology**

Figure 2.

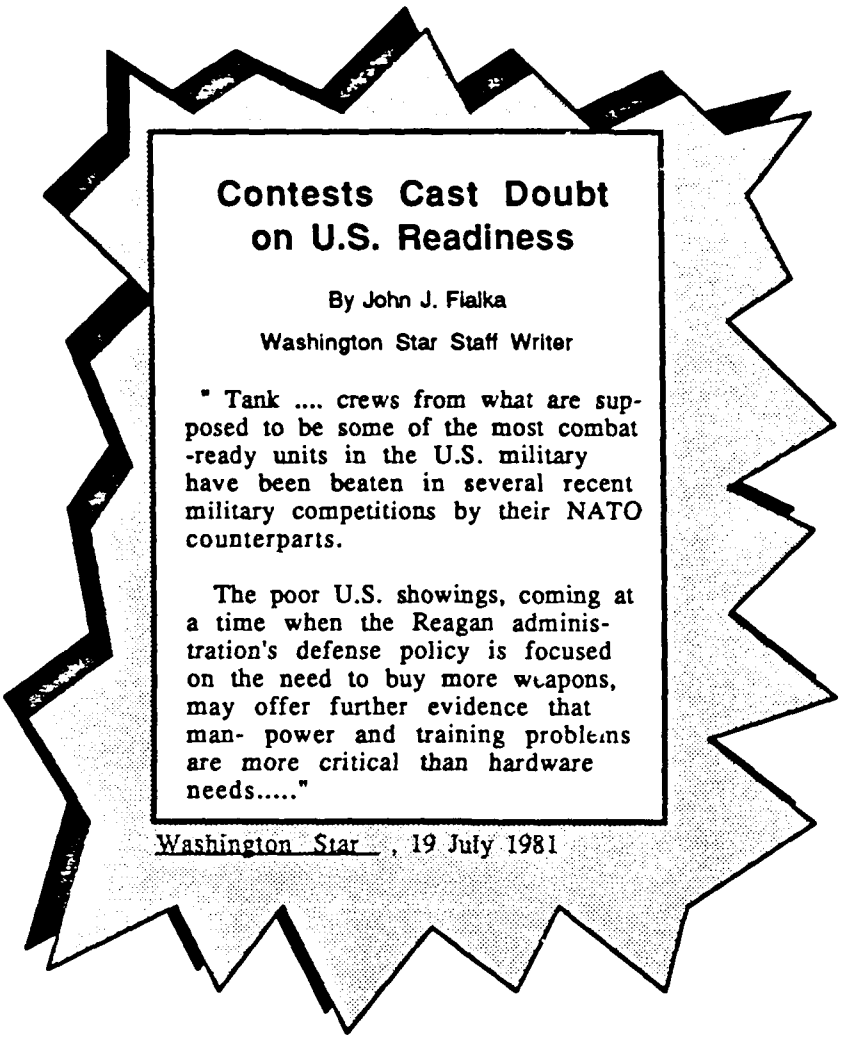
The location of the CAT competition tank range is a major issue. Because of extremely demanding accuracy and time standards required to win CAT, range familiarity, accumulated over time, is a winning edge. Even though exact battle run target scenarios might be unknown or random, knowledge of target locations, distance to targets, vegetation, dead space, etc., are almost certain to produce additional target hits in less time. Through CAT '79 , all of the competitions were held at Bergen-Hohne, a NATO training area familiar to our European Allies, but with limited access for American tank units. A serious evaluation of competition results must consider this "home field" factor. Because the competing national armies have come to fully recognize the potential advantages of this factor, a change occurred. Since CAT '81 , hosted by the United States at its training base in Grafenwoehr , Germany, the competition range location has alternated between Bergen Hohne and Grafenwoehr.

The organization of the CAT teams relative to their standard national organizations is another significant issue. When the directed CAT organization materially differs from the standard national organization, there is an undeniably negative impact on team-building potential and unit readiness. The typical CAT team is a tank company comprised of a designated number of firing tank platoons with a designated number of tanks. For CAT '81 , the competing national company teams consisted of five tank platoons of three tanks each. Although this was partially compatible with some of our allies' standard organizations, it was completely foreign to the US Army's tank company organization. The standard US tank company of three platoons had recently undergone a transition from five to four tanks. The CAT three tank configuration forced a break of unit integrity and familiar command and control procedures in the face of the most stringent performance standards.

A third subtle but significant issue, the method for selecting the competing teams, tends to influence the CAT outcome. There are three major elements here -- team selection, the timing of the selections relative to the actual competition, and resources (primarily tank main gun ammunition and tank training ranges) allocated to the selected teams. Although countries are free to establish their own internal methods for CAT team selection up to a point, much of the final selection procedure is standardized and directed by the Committee of Control in the CAT rules and conditions. The selection options generally range from the establishment of a single "gladiator" company of highly skilled, CAT-experienced soldiers, to a random

selection from a designated pool of tank companies generally representative of the national tank forces. The timing of the team selections, in combination with permissible resource allocations, will have a tremendous impact upon team organization and training strategy, as well as the combat readiness of the units. In general, the smaller armies tend to adopt a strategy to enter their predesignated gladiator companies and force the large armies (Germany and the US) into a random selection late in the training cycle. Late selection tends to dilute resources and put the large army teams on an "equal" resource basis with the smaller armies. This tug-of-war is usually resolved by a different compromise for each CAT.

Although the US teams showed steady progress during their early years in CAT, their highest finish, third in 1981, drew severe criticism in our national press.[6]



Contests Cast Doubt on U.S. Readiness

By John J. Fialka

Washington Star Staff Writer

" Tank .... crews from what are supposed to be some of the most combat -ready units in the U.S. military have been beaten in several recent military competitions by their NATO counterparts.

The poor U.S. showings, coming at a time when the Reagan administration's defense policy is focused on the need to buy more weapons, may offer further evidence that man- power and training problems are more critical than hardware needs....."

Washington Star , 19 July 1981

Figure 3.

The far-reaching implications of such criticism are difficult to over-estimate. Major acquisition programs can be jeopardized. Troop morale throughout the U.S. armed forces can be damaged. Public confidence in and support of our military forces can be seriously degraded. The deterrence value of our alliances can be diminished, as the readiness of the foundation forces is questioned.

Unfortunately, the U.S command structure in Europe was slow to recognize the potential risks of merely participating in, rather than winning, the Canadian Army Trophy competition. In February 1982, General Kroesen , CINCUSAREUR, was questioned in the Senate Ap-

propriations Committee regarding the poor performance of American teams.

"Q. General Kroesen, many observers look to international competition as a way of measuring the training or readiness of U.S. forces. What emphasis does your command place on international competition?

A. "..... Our philosophy with respect to international competitions has always been that they disrupt normal training, are no measure of the true readiness or competence of the whole force, but that they are an excellent peacetime pursuit which contribute to high morale and esprit de corps among the soldiers and units which compete for the honor of representing the United States. In the past we sent our competitors into matches as normal well-trained crews. The poor showing in past years was the result, and we had to learn to marshall resources, engage in special training, and assure close adherence to special competition practices and procedures....."[7]

In the early 1980s, with strong recruiting and retention programs taking hold, new M-1 tanks and training technologies on the way, and some "CAT savvy" earned the hard way, the U.S. Army made the commitment to win CAT in the future.

CAT: 1983-1985

The U.S. Army's fight to win CAT would prove to be an uphill battle but promised to pay the rewards that accrue to winners.

Through CAT '81 , the competition was structured on a national basis with the result that emphasis was being placed on excellence in tank gunnery at the noticeable expense of allied cooperation. And the competition was indeed sharp, alerting the AFCENT leadership that it needed to bolster the second purpose, fostering teamwork among the allies.

Beginning with 1983, in a restructured competition, the Canadian Army Trophy was awarded to the Army Group team [Central Army Group (CENTAG) or Northern Army Group (NORTHAG)] with the highest composite score. For the most part, this has been a very positive change. The national teams have even conducted some joint CAT training events, and the cooperation has been good.

The formation of Army Group teams placed German and U.S. units on both teams, thus somewhat diluting their concentration of effort and resources--but also increasing the numbers of firing platoons and the mathematical probability of winning. There was a more subtle positive effect for the Americans. It significantly expanded the number of soldiers with CAT experience and U.S. appreciation for the high levels of performance a unit can achieve.

The American tankers made a strong showing in CAT '83 , at Grafenwoehr. But it was not strong enough to beat a German platoon equipped with Leopard 1A1s. One American company (3-64 Armor , 3 ID), the first unit equipped with M-1s, had a platoon that finished second. Another American company (2-66 Armor , 2 AD Forward), equipped with older M60A1s finished third. Another American company (1-32 Armor , 3 AD) gave a creditable performance.[8]

The 1983 British competitors, with upgraded fire controls in their Chieftain tanks, could place a platoon no higher than ninth in a field of 10. The British press was quick to highlight their results:

"Gunnery of British Tanks a Disaster

Serious doubts have been raised about the effectiveness of Britain's tank force, and whether the vehicles have any hope of surviving for long in a battle with the Soviet T72 tank.

The public debut of the new fire control system for the Army's Chieftain and Challenger tanks in a NATO gunnery contest in June proved a dismal flop.....

.....one very senior observer, believed to be a high-ranking general described the British performance in the biennial competition on Hohne ranges, West Germany, on June 20-24 as a disaster."[9]

Based on this Times article, it appears that the British attributed the major blame for relatively poor performance to deficiencies in the Chieftain tank. Other aspects, vital for success, were not mentioned.

In the 1985 contest, held at Bergen-Hohne, the Americans finished only one battlerun from victory. The much anticipated show-

down between the American M1s and the modern German Leopard 2s ended with a narrow German victory on the very last battlerun. The men of 3-64 Armor, 3 ID, finished second; 2-66 Armor and 3-32 Armor finished further back.[10]

The first significant trend that emerges in 1985 scoring (see Figure 4.) is the substantially better performance of the units equipped with the more modern tanks (M1s, Leo 2s). The contrast is clear among the three U.S. tank companies, where 3-32 Armor competed with the older M60 series tanks.

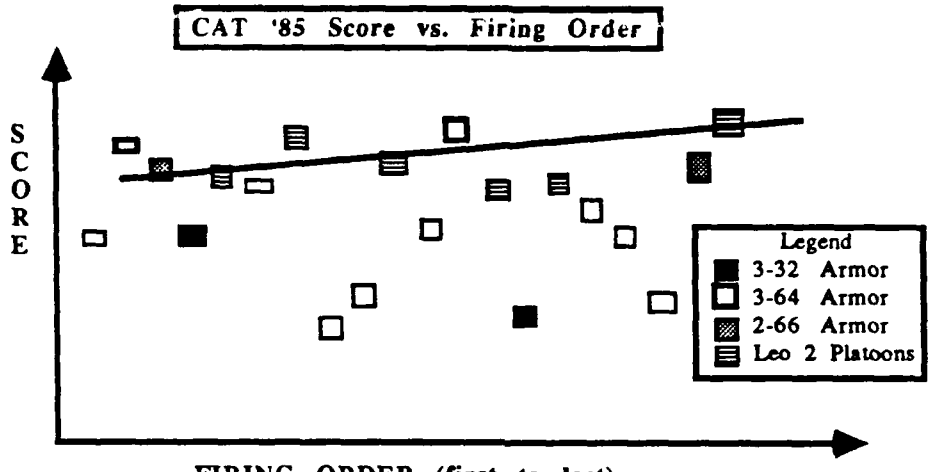
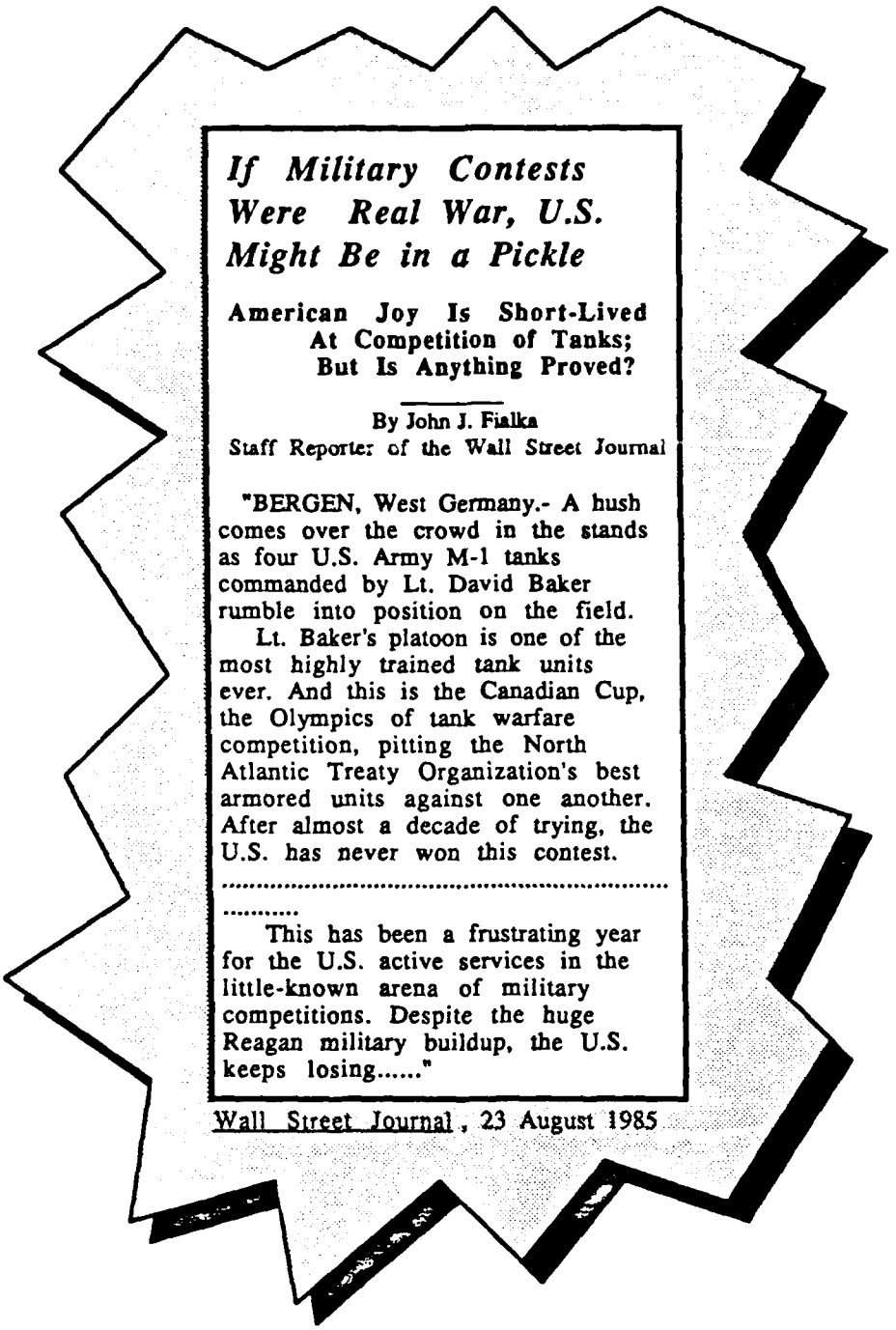


Figure 4.

A second trend, this one not so discernible--but key to the competitors-- is the improvement of scores with time in the units equipped with more modern tanks. This trend peaked when the German unit making the last battlerun scored the highest. This trend may have been more pronounced but for heavy, cold rainfall late in the contest.

The Americans' near victory seemed to encourage the press to sharpen its' aim.[11]



If Military Contests Were Real War, U.S. Might Be in a Pickle

American Joy Is Short-Lived At Competition of Tanks; But Is Anything Proved?

By John J. Fialka
Staff Reporter of the Wall Street Journal

"BERGEN, West Germany.- A hush comes over the crowd in the stands as four U.S. Army M-1 tanks commanded by Lt. David Baker rumble into position on the field.

Lt. Baker's platoon is one of the most highly trained tank units ever. And this is the Canadian Cup, the Olympics of tank warfare competition, pitting the North Atlantic Treaty Organization's best armored units against one another. After almost a decade of trying, the U.S. has never won this contest.

.....

This has been a frustrating year for the U.S. active services in the little-known arena of military competitions. Despite the huge Reagan military buildup, the U.S. keeps losing....."

Wall Street Journal, 23 August 1985

Figure 5.

On 23 August 1985, a stinging Wall Street Journal headline set the negative tone for an article that was actually quite positive regarding the overall American performance. Buried deep in the article, the reader could discover the fact that the average score of all American units actually exceeded the German average. Although such statistics can be likened to the loser of the World Series getting more overall hits than the winner, it paints quite a different picture than the headline.[12]

A civilian friend of mine mailed this article to me in August 1985, shortly after I took command of 2-66 Armor. He was familiar with my role in developing the M-1, and he knew the battalion had competed in CAT '85 . After a brief introduction, his letter asked the pointed question--"What's wrong with U.S. tankers and their new tank?"

The U.S. tankers knew the answer--but they could not prove their conclusion without the elusive CAT victory.

"I didn't even know what a M1 looked like. I knew nothing about it--but I love it."[13]

PFC Steven Kuhn
Driver, D14, 4-8 Cavalry
CAT '87

But the foundation had been laid in 1985. In preparation for CAT '85, the Americans trained hard on a new tank gunnery simulator, the Unit Conduct of Fire Trainer (UCOFT). Training with this simulator (a computer configuration like the gunner and tank commander stations in the M-1) and a customized "CAT disk" mapping the competition range and potential target arrays, the U.S. teams were able to somewhat offset the lack of range time and do more battleruns within the main gun ammunition allocation. Unfortunately, the UCOFTs had not yet arrived in Europe, so all the teams were flown to Florida to do the training.[14]

The CAT '85 performance of the Dutch team (3rd overall, 1st on the winning NORTHAG team) deserved notice. The Dutch possessed some obvious advantages, such as being stationed at Bergen-Hohne and being equipped with the Leopard 2 , but they are also a small conscript army. Also on the leading edge in some training technology, they have made a national commitment to win CAT. The

Dutch clearly established themselves as leading contenders for future contests.

The British performance in CAT '85 once again drew fire from their press:

"British Tank Fares Badly in Contest

Deficiencies in British tanks when compared to the latest American and West German tanks have again been exposed in a recent gunnery competition held in West Germany.

Military sources in Britain and NATO said the reason the British squadrons did not do well in the competition was that their fire control system had been overtaken by more modern systems on the American M1 Abrams and the West German Leopard 2 tanks. The main difference appears to be in the speed at which targets can be acquired and the first shot fired. One source said that although this difference produced poor competition results, it did not make the difference between success and failure in war."[15]

Once again, the British attributed their poor performance to their tank rather than to multiple sources such as personnel and training.

CAT: 1987

The Central Army Group hosted CAT '87 on Range 301 at Grafenwoehr Training Area, a U.S. controlled major training area. The American competitors looked forward to the victory that they had yet to achieve and had narrowly missed in CAT '85.

> "Oh yes, there was lots of patriotism out there. We put flags on the sides of the tanks and flags on the antennas, and we kind of felt like--we definitely felt like we were America's entries in the Olympic tank

gunnery [competition]." [16]

PFC Brent Berry
Driver, D12, 4-8 Cavalry
CAT '87

Rules and Conditions

Preparations began early in 1986 with the formulation of the CAT '87 Rules and Conditions. The major rules and conditions that governed the preparation for and the conduct of CAT '87 had special significance for those who were organizing and preparing a competitor. I add commentary (*in italics*) to amplify the significance of an item when necessary. There were actually many more items, and each item was significant and received intense study by competing units in an attempt to gain some subtle advantage.[17]

Canadian Army Trophy Committee of Control (CATCC)

0 The presence of all CATCC members or authorized representatives is required to hold a meeting. *Committee decided all rules and conditions--and all changes.*

0 At least 70% (9 of 12) members must agree on any decision. *Only one of these members was American.*

The Competition

0 Competition between tank platoons from NORTHAG and tank platoons from CENTAG is as follows:

NORTHAG		CENTAG	
I (Belgian) Corps	2 Platoons	II (German) Corps	2 Platoons
I (British) Corps	3 Platoons	III (German) Corps	2 Platoons
I (German) Corps	2 Platoons	V (U.S.) Corps	3 Platoons
I (Dutch) Corps	2 Platoons	VII (U.S.) Corps	3 Platoons
2 AD (Fwd) (U.S.)	3 Platoons	4 CMBG (Canadian)	2 Platoons
5 Companies/12 Platoons		5 Companies/12 Platoons	

0 Each platoon organizes with its organic number of tanks. *This was a change from the past and was urged by the U.S.*

0 The host army group (CENTAG) informs HQ AFCENT of the competition range selection not later than 1 January 1987.

0 The competition range is out of bounds to all companies in the random selection pool from 1 January until the competition.

Team Selection Criteria

0 Random selection pool. Each Army Group Corps designates minimum of one company from two different battalions; each separate brigade designates a minimum of two companies. *The U.S. urged the random concept in an attempt to overcome a perceived advantage gained in the past by some countries that pooled and concentrated especially skilled tankers.*

0 The formation of special companies and/or alteration of national personnel assignment policies for the competition is prohibited. *The limits of this rule were liberally interpreted.*

0 Headquarters AFCENT makes a random selection of the tank companies to compete no later than 1 April 1987.

0 Tank commanders and gunners may not compete in successive CATs in the same duty position as the preceding CAT. Exceptions may be made, for example, as in the case of a 1985 tank commander promoted to Platoon Sergeant. *The U.S. had lobbied for a provision like this to break up alleged "professional CAT teams" of some allies. It had some adverse impact on 2-66 Armor as it filled out its required two tank companies for the random selection pool.*

0 Company rosters (by crew position) for all companies in the pool must be submitted by 27 March 1987. Only those on this roster will be permitted to compete in June.

Other Key Rules

0 Total main armament ammunition expenditure for designated tank companies is not to exceed 134 rounds per crew from 1 October 1986 to the competition.

0 Main gun zeroing procedures must be done according to national procedures.

Battle Run Description and Conduct

Every CAT platoon battle run is supervised by the Chief Judge. However, the national judge of the army of the firing platoon issues all instructions to the platoon leader during the battle run.

"By this time I was so pumped up I was ready to go out there. I knew I could do it. I knew I had to do it and I knew these other guys would do it too. I hoped they were feeling the same inside as I was. I knew I could go out there and pump those rounds into the targets."[18]

Corporal Jeffery Normand
Gunner, D11, 4-8 Cavalry
CAT '87

About two hours before its battle run the platoon occupies the calibration range and is allowed one hour to zero its tank weapons. In the case of the First Platoon, one of its tanks failed to zero properly, requiring the crew to quickly swap tanks.

"Sergeant Mariano, you've done this before. It's nothing new to you." [19]

1LT Edward Masser
Platoon Leader, 1st Platoon
D Company, 4-8 Cavalry
CAT '87

Upon the completion of zeroing, the American platoon moves to a waiting area until called forward by the national judge. On the orders "MOVE TO BOUND ONE" and "CARRY OUT ACTION," the platoon leader dashes (as only the M1s will dash) the platoon along a trail past the spectator stands--full of soldiers, families, and contractors waving unit and American colors. The platoon's favorite recording, the background music from the movie "Top Gun," blares out over the loud speaker system. Upon arrival at Bound One, the platoon has two minutes to prepare the weapon systems to fire. The platoon leader transmits "READY" in precisely two minutes.

The national judge commands, "WATCH YOUR FRONT." The tank commanders and gunners scan their SOP-designated sectors with an uncommon concentration. There is a delay as the computer activates the proper targets. Then, over the platoon radio net,"TARGETS UP" initiates the platoon's target acquisition and fire distribution system. The platoon gunners "kill" the target array (see Figure 6.) in seven seconds, even though 40 seconds are available!

Concise crew reports are transmitted to the platoon leader to account for all targets, target hits, and ammunition fired.

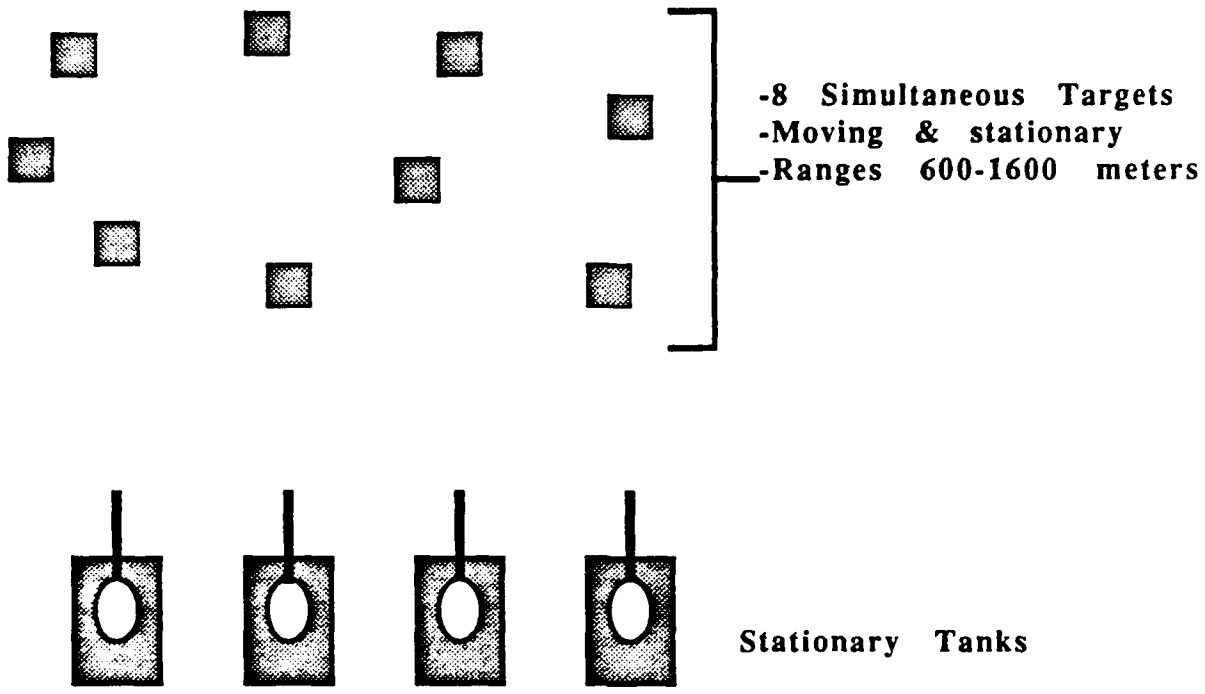


Figure 6.

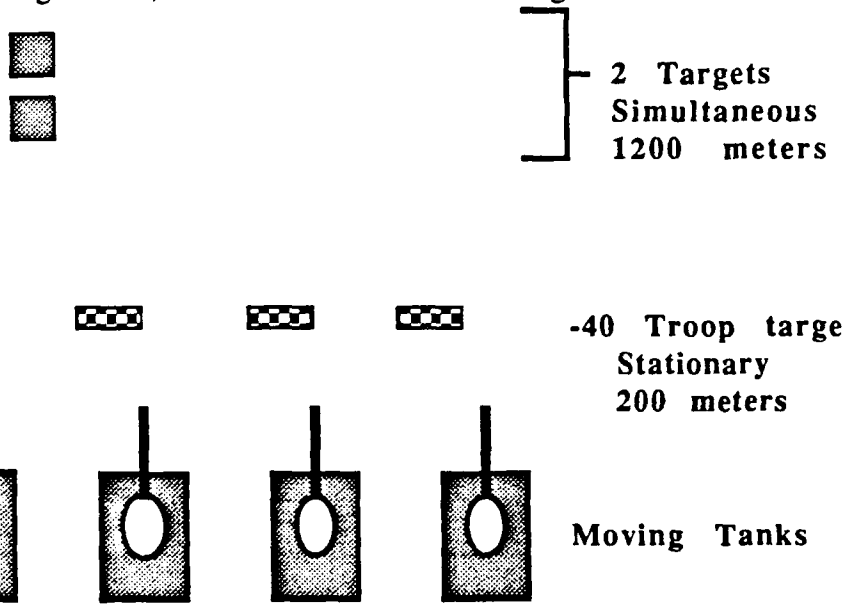
When the scenario calls for no more targets to be presented, all targets are lowered. The national judge commands, "YOUR FRONT IS CLEAR. MOVE TO BOUND TWO."

The platoon leader moves the American platoon--all eyes riveted to assigned sectors. The first targets to appear (see Figure 7.) are the troop targets (falling plates). Some of the tanks engage these with the startling accuracy of their stabilized machine guns while others watch for the inevitable main gun targets. "TARGETS UP" barely beats the first blast of the main guns from the stable platforms of their moving M1s. Suddenly, there is a call for help from one of the tanks as its machine gun switch fails to operate--preventing the gunner from engaging his troop targets.

"...we were prepared for anything to go wrong. It happened to us all the time. We'd just say get out of the way quick, do it ,fix it....It helps if you have way in the back of your mind that something might happen. then you handle it better than saying nothing's going to happen."[20]

SP4 Steven Kuhn
Driver, D14, 4-8 Cavalry
CAT '87

The wing tank switched to the partial set of troop targets in time to hit all but three before it was unsafe to cross fire. The other tanks switched sectors, as planned, to account for all main gun targets, target hits, and ammunition remaining.



MOVEMENT - Bound 1 to Bound 2

Figure 7.

Then the tanks accelerate their power-packed 1500 horse-power turbine engines to sprint to the next bound to beat the penalty clock.

At Bound Two, the platoon analyzes their "new" sector--they have seen it hundreds of times before on the Simulation Network (SIMNET) trainers. The national judge issues the command "WATCH YOUR FRONT." The nerve-racking delay takes forever as the computer activates the targets. "TARGETS UP" pierces the airway as three targets appear (see Figure 8.). They are quickly taken out! Four more appear.

> *"I was down there. Whenever we weren't moving I had my binoculars up in my little driver's periscope and I saw [target] 426 came up--and I said, it's 426--and SGT Knox knew my voice real well and he knew exactly where....and we got it, like two seconds after we hit the last one."*[21]
>
> **PFC Brent Berry**
> **Driver, D12, 4-8 Cavalry**
> **CAT '87**

They are hit! The accounting procedure begins. Four more targets appear--unlike any preceding scenario. They are quickly hit and counted. The round count is passed to the platoon leader.

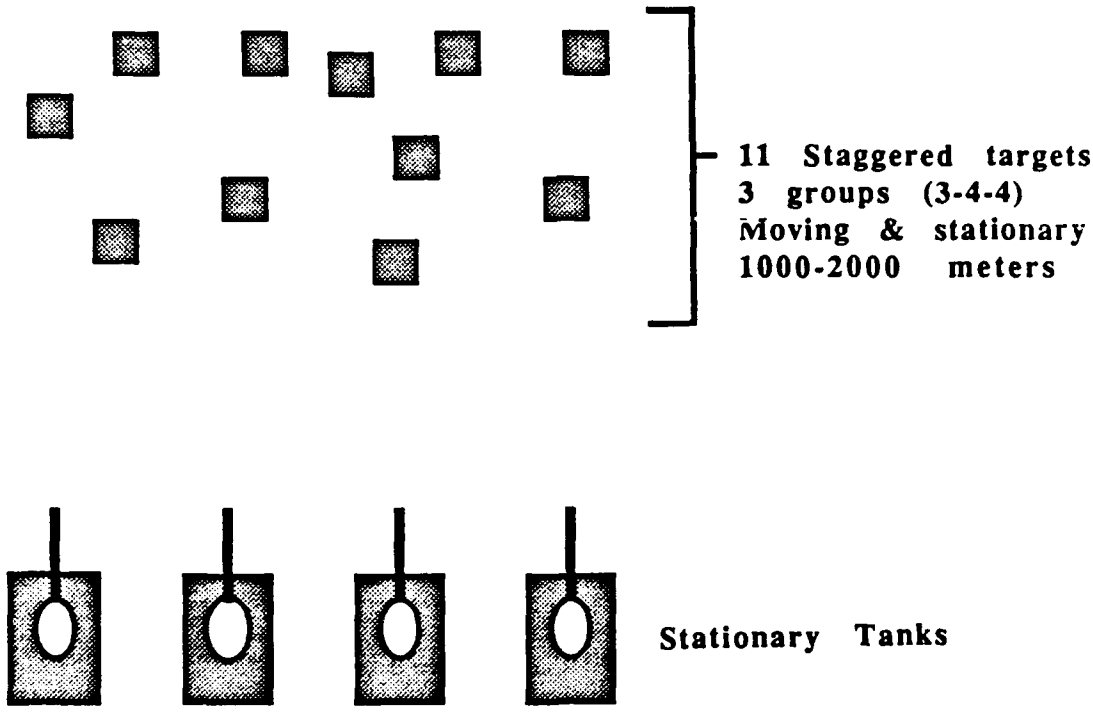
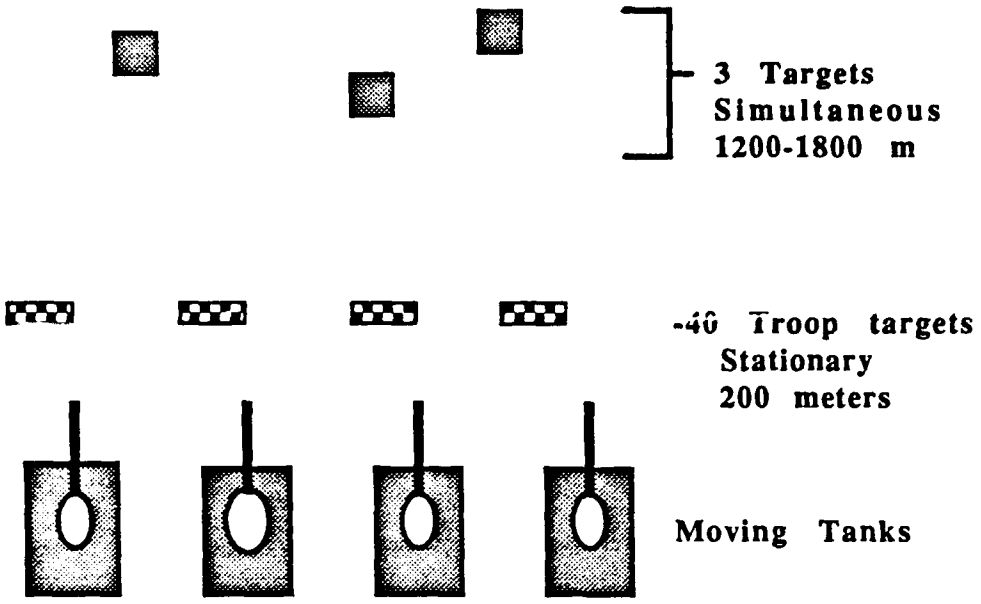


Figure 8.

The national judge issues the command "YOUR FRONT IS CLEAR. MOVE TO BOUND THREE." The platoon leader moves his platoon and encounters a target array (see Figure 9.) very similar to the move between Bounds one and two. The targets are hit with ease--just as they had been during the many practice battle runs.



MOVEMENT - Bound 2 to Bound 3
Figure 9.

Once again, the tank drivers confidently accelerate their powerful turbines to get the platoon to Bound Three before the time runs out. The speed and power of the M1s buys a large margin of safety again.

The platoon leader knew he had eight main gun targets remaining and plenty of ammunition as he waited for the national judge's "WATCH YOUR FRONT" command. He did not know how they would appear. But his platoon was ready as the tank commanders and gunners concentrated on their sectors.

The national judge issued the command. "TARGETS UP" soon followed as the expected eight targets (see Figure 10.) appeared simultaneously, many of them tucked into the shadows of the distant wood line. Almost instantly, four shots cracked from the tank cannons--then a short pause--four more tracers streaked to their

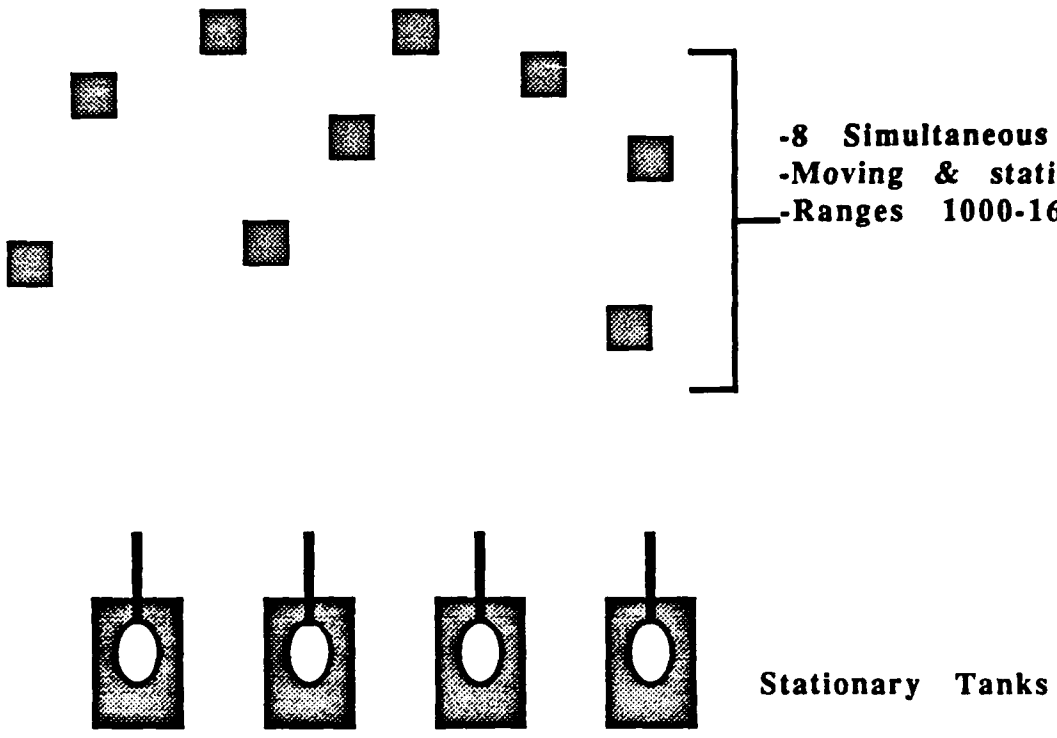


Figure 10.

targets. The tank commanders quickly reported eight targets engaged and hit--five main gun rounds remaining. By the platoon leader's count, all 32 targets had been sensed as hits.

"They knew the standards. I knew they could achieve it. And when they started to achieve it, they believed it. When they believed it, there was no telling what could happen."[22]

1LT Edward Masser
Platoon Leader, 1st Platoon
D Company, 4-8 Cavalry
CAT '87

The major rules and conditions that governed the actual battle runs follow.

0 Main Gun. The scenarios, planned by the Chief Judge, will include a minimum of 18 or 24 targets and a maximum of 27 or 36 targets depending on the number of tanks in a platoon; however, the total number of targets will be the same for each similar sized platoon (the British had three-tank platoons; all others had four-tank platoons). The Chief Judge will advise Team Captains of the total number of targets (the decision was 27 and 32, respectively) the day prior to the competition. The targets will be static or moving (up to about 20 mph). The movers may be head-on, oblique or broad side. *Without knowing the exact number of targets, there was little option but to train against the maximum.*

0 Machine gun. The scenarios are two groups of 10 targets (falling metal plates) per firing lane (total of 20 targets per tank). These targets will be engaged while on the move between bounds.

0 All targets may be engaged by one or more tanks within the platoon.

0 Each main gun engagement will be comprised of two to eight targets at various ranges. Main gun targets need not be visible to each tank within a platoon except on the last bound where all main gun targets are to be visible to each tank.

0 There will be a minimum of 12 different target scenarios and two spare scenarios for reruns. In selecting the scenarios, the Chief Judge will draw them by lot on the evening of the preceding day at the earliest. Each scenario must include as a minimum:

--Stationary Firing Tanks: Five main gun engagements including (1) two engagements with both static and moving targets, and (2) one engagement with six/eight targets depending on platoon size.

--Moving Firing Tanks: Two main gun engagements must be while on the move against both moving and static targets.

0 During a move, all targets must be engaged while moving.

0 The time allowed for each move between bounds will average about 10 mph.

0 Main gun targets will be exposed for 40 seconds. Their presentation may be staggered in time. *This was new for CAT '87 and substantially increased the degree of difficulty. It was also more in line with combat conditions.*

0 All target hits will be spotted and timed by an individual observer. All hits are verified by a physical hole count (or a downed plate in the case of machine gun targets.

0 Scoring .

Main gun: Hit Score = $\frac{\text{(Total target hits x 100)}}{\text{Total targets}} \times 100$

Time Score = $\frac{\text{Total hit time + (40 sec) x (misses)}}{\text{Total targets x max exposure time}} \times 100$

Hit bonus = 500 points for hits on all targets

Ammunition bonus = $\frac{\text{(Rounds Remaining)}}{\text{Total rounds}} \times 100 \times 40$

(*only if all main gun targets are hit*)

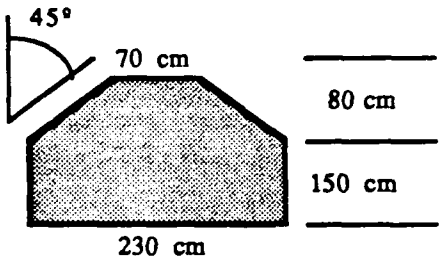
Machine gun: Hit Score = $\frac{\text{Targets Hit}}{\text{Total Targets}} \times 100 \times 20$

Penalties: 600 Points -not arriving on bound in time; 1000 pts./rnd. -unauthorized use of reserve ammo.

0 Ammunition. Each tank is to stow 10 target practice rounds for the main armament and 250 rounds of machine gun ammunition. A reserve of four main gun rounds and 125 machine gun rounds will also be carried, but used only at the specific direction of a judge.

0 Targets will be in a configuration as shown in Figure 11. They will be painted a dark color and heated. There will be heated decoys on the course.

Main Gun Targets



Machine Gun Targets

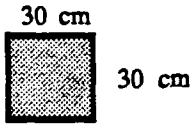


Figure 11.

0 Some type of visible hit indicator system will be used, if possible. *By about February 1987, it became evident to the American units that the CATCC had no intention of including hit indicators (smoke, flares, falling targets, etc.) as this rule specified. The official reason was that no reliable (>85%) system could be found and that a system of this reliability would be a source of numerous protests. We believe that the real reason was that some of the other competing nations knew that hit indicators would make an American victory very probable because of the M1's faster fire control system. On the other hand, they knew that their 120 mm round penetrator would make larger holes (thus, much easier and faster to sense-- especially with the higher power sights, 13x vs. 10x , of the Leopard 2) than the 105 mm round penetrator of the M1. This would be a big advantage on the long range targets. The Dutch even made the decision to use the less accurate 120 mm HEAT round because it makes a much larger hole than the penetrator of the 120 mm Sabot round. In fact, HEAT holes can easily be detected with the naked eye at ranges over 2000 meters. As a consequence of the failure of the CATCC to include hit indicators, the accurate and rapid sensing of American shots became a major training issue that was never solved satisfactorily.*

In addition to describing the evolution of the Canadian Army Trophy competition and exposure to the rules governing the contest, I will cover the detailed results of CAT '87 and try to provide insight into the intricate process of building the 1987 American CAT teams in the next section.

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[1] From transcripts of personal interviews conducted by Soldier's Radio and Television, February 1988.

[2] Ronald E. Kramer and David W. Bessemer, "Tank Platoon Training for the 1987 Canadian Army Trophy (CAT) Competition Using a Simulation Networking SIMNET) System" (ARI Field Unit-Fort Knox, KY. report), October 1987,p.2.

[3] From transcripts of personal interviews conducted by Soldier's Radio and Television, February 1988.

[4]

[5] LTC John C. Heldstab, "International Military Competitions-An Examination of the Canadian Army Trophy Competition", US Army War College, Carlisle, PA., 15 April 1982, pp.2-4.

[6] John J. Fialka, " Contests Cast Doubt on U.S. Readiness", The Washington Star, 19 July 1981, p.2.

[7] U.S. Congress, Congressional Record, Insert for the Record, 23 February, Line 16, p.77.

[8] Major James D. Brown and Captain K. Steven Collier. "The Dinosaurs Ain't Dead!", Armor, September-October 1983, p. 21.

[9] "Gunnery of British Tanks a Disaster", The Times, 5 September 1983, p. 2g.

[10] U.S. Army Armor School (ATSB-WP-GD) Memorandum, Subject: Trip Report-1985 Canadian army Trophy (CAT) Competition, 12 July 1985, pp.4-12.

[11] John J. Fialka, "If Military Contests Were Real War, U.S. might Be in a Pickle", Wall Street Journal, 23 August 1985, p.1.

[12] Ibid.

[13] From transcripts of personal interviews conducted by Soldier's Radio and Television, February 1988.

[14] U.S. Seventh Army Training Center. Canadian Army Trophy (CAT) After Action Report, 3 September 1985, p.3.

[15] Rodney Cowton, "British Tank Fares Badly in Contest", The Times, 27 June 1985, p.5.

[16] From transcripts of personal interviews conducted by Soldier's Radio and Television, February 1988.

[17] HQ AFCENT. Canadian Army Trophy (CAT) Competition 15-19 June 1987 Rules and Conditions, 2 June 1986.

[18] From transcripts of personal interviews conducted by Soldier's Radio and Television, February 1988.

[19] Ibid.
[20] Ibid.
[21] Ibid.
[22] Ibid.

Building a Winning Team

Chapter 3

The Baseline: Strategy and 1987 Results

To win the Canadian Army Trophy competition, an army must assign that specific mission to a chain of command dedicated to excellence, willing to marshall the resources necessary to win, and capable of focusing those resources on hitting every target presented in the shortest possible time. Then, the command must assemble the finest soldiers it has, both tankers and supporters, and provide the leadership from top to bottom that can mold a championship team. The army must issue the team the best tanks and ammunition it has, and support the team with the most effective state-of the-art training resources fielded or in development. The training program must carefully synchronize the application of these resources and must address every facet of the soldiers' lives in order to prepare them mentally and physically. The CAT team's leadership must thoroughly analyze every task, condition and standard that must be accomplished to win and chart specific progress toward perfecting those tasks. The leadership must also anticipate the conditions and factors that cannot be controlled during the competition, so that orderly adjustments can be made. In the end, the winner will probably be the team that best overcame the "unexpected" situations that are certain to occur.

"We had generals come down, the Secretary of the Army came down, the highest ranking general in USAREUR came down. They all said we will win it this year. After you hear it that many times, you've got to think maybe they know something we don't....We had everybody pulling for us. If we needed anything, it was there."[1]

Corporal Jeffery Normand
Gunner, D11, 4-8 Cavalry
CAT '87

The Winning Strategy

The 4-8 Cavalry winning strategy was formulated early and at the top level of leadership in the 3rd Armored Division--the Division Commander and his principal staff. They called their overall strategy the "CAT Attack Plan". Its principal developers were members of the division CAT Operations Cell--the G3 (Chairman), G1, G4, Resources Manager, Surgeon, Chaplain, Public Affairs Officer, G3 Training, Division Master Gunner and the Support Command operations officer. This CAT cell thoroughly analyzed after action reports from previous competitions as well as the CAT '87 Rules and Conditions. Based on their analysis, they performed a thorough individual and collective task analysis, projected the competition conditions, and established the standards of achievement for each task required to win. The CAT cell met frequently to ensure the pieces were falling into place.[2]

The CAT attack plan was a comprehensive strategy consisting of the personnel policies, training program, logistics support and resource allocation for CAT. It contained the coordinated, detailed guidance to the division and assigned chain of command responsibility for such key items as: selection and organization of the CAT team; emphasis of the team concept; sequence and conduct of training; and integration of logistics support. It set the simple training goal of developing three tank platoons capable of first-round hits on all main gun targets and it set a path to get there. Pre-established "cut" dates and events were set to get the best of the tankers and induce competitive stress. The effect of the strategy--the CAT Attack Plan--was to focus, in a coordinated manner, the attention and resources of the division command structure toward winning CAT '87.[3]

No formulation of a grand strategy of the scope and scale of the 3rd Armored Division was done by the other two divisions. As I proceed through the detailed analysis and comparison of each units' programs using the 3 AD approach as the baseline, it will become evident that I believe the scope of their strategy made a winning difference.

This section discusses in detail the major aspects of building the three American CAT '87 tank companies. After a review of the

1987 competition results, you will be presented a first-hand, top-down account of the U.S. chain-of-command's approach to organizing and supporting a winning effort. Then, based on the unit after action reports and the author's personal accounts, you will get a close look at the methods used by the 4-8 Cavalry, the 3-64 Armor and the 2-66 Armor. The factors to be examined include manning, training, and equipment and support. Such a perspective will permit a comparison of the strengths and weaknesses of these programs. Finally, I will draw some conclusions as to what factors in the winning team's program really made a difference.

However, in reading these chapters, one should remember that there probably is not a "magic formula" for developing and implementing the details of the process described in the first paragraph of this section. There are many real world constraints that affect the competing units to different degrees. I will try to point out the major ones. There are also many professional opinions regarding particular aspects of team building and training programs. Certain techniques and lessons learned have worked well under a particular set of circumstances, but they fail miserably when even a seemingly minor ingredient is subtly changed. Sometimes even the members of the winning team do not fully understand what gave them the very narrow winning margin unless they also look outside their program.

But we do know that the U.S. 3rd Armored Division, and more specifically 4-8 Cavalry, found a winning formula to build the CAT '87 winner, D/4-8 Cavalry. They did not win by accident. Members of the 4-8 Cavalry believed they had put together a winning program--and they were right. The two other American teams, D/2-66 Armor, 2 AD(Fwd) and A/3-64 Armor, 3 ID, did not win--even though their circumstances and training programs appear to have had many common ingredients with the D/4-8 Cavalry. All three teams thought they had built a CAT winner. In an analytical approach, a comparative analysis of the three programs brings out which factors really made a difference. Under all circumstances, the baseline case is the 4-8 Cavalry program because we know it produced a winner.

This analysis is not a criticism of any aspect of the 4-8 Cavalry or 3-64 Armor programs. The author appreciates more than most the price that must be paid to win CAT and the Monday morning quarterbacking that competing units are subjected to.

CAT '87 Detailed Results

Using the results of the 1987 competition, I will present the data in several different ways to more clearly highlight the similarities and differences in the American units' performance.

What has happened to most teams, especially the Americans, is a quantum jump in improved performance in CAT '87 as compared to CAT '85. Even though the competition range, the target scenarios, and the scoring systems were somewhat different, the 1987 results show a strongly improving trend:[4]

- In CAT '85, the maximum number of main gun targets was 24, and the platoons could shoot 40 rounds to kill them. The most targets hit were 23. In CAT '87, the maximum number of main gun targets was 32, but the platoons were allowed the same 40 rounds. Two platoons hit all 32 and they did it with 35 rounds.

- In CAT '85, the U.S. M1 platoons averaged 74.46 % of the maximum score; the German Leo 2 platoons averaged 73.14 % (the range of performance was 74.6 to 50.66). In CAT '87, the U.S. M1 platoons averaged 81.33 % of the maximum score; the German Leo 2s averaged 84.26 % (the range of performance was 84.26 to 64.16. All but the British were above 75 %).

So, the trend is clear. We're all getting better as the battle for "Top Gun" ensues.

Figure 12, below arrays the platoons in descending order of finish. The dominance of the modern tanks is clear, although the performance of the Leo 1 - equipped Canadian platoon (6th place) and the Belgian platoon (9th place) raised eyebrows. The Canadians trained on the U.S. SIMNET (see Chapter 5) as guests of the 3 AD, and this may have been a positive factor.

CAT ' 87 RESULTS [5]

PLACE	UNIT	TANK	NATION	ARMY GROUP	SCORE
1	1/D/4-8 CAV	M1	US	CENTAG	20490
2	1/4/124 PZ	LEO 2	GE	CENTAG	19690
3	1/A/3-64 AR	M1	US	CENTAG	18827
4	2/3/363 PZ	LEO 2	GE	CENTAG	18657
5	1/C/43 TK	LEO 2	NL	NORTHAG	18260
6	2/C/RCD	LEO 1	CA	CENTAG	18062
7	2/D/4-8 CAV	M1	US	CENTAG	18005
8	2/4/124 PZ	LEO 2	GE	CENTAG	17722
9	1/A/4 LN	LEO 1	BE	NORTHAG	17495
10	1/3/363 PZ	LEO 2	GE	CENTAG	17410
11	3/D/2-66 AR	M1	US	NORTHAG	17352
12	1/D/2-66 AR	M1	US	NORTHAG	17352
13	1/C/RCD	LEO 1	CA	CENTAG	17157
14	2/D/2-66 AR	M1	US	NORTHAG	17125
15	3/D/4-8 CAV	M1	US	CENTAG	16930
16	3/A/3-64 AR	M1	US	CENTAG	16792
17	2/A/3-64 AR	M1	US	CENTAG	16700
18	3/4/324 PZ	LEO 1	GE	NORTHAG	16672
19	1/4/324 PZ	LEO 1	GE	NORTHAG	16445
20	3/A/4 LN	LEO 1	BE	NORTHAG	16422
21	3/C/43 TK	LEO 2	NL	NORTHAG	16365
22	2/B/ROY HUSS	CHALL	UK	NORTHAG	14036
23	3/B/ROY HUSS	CHALL	UK	NORTHAG	14260
24	1/B/ROY HUSS	CHALL	UK	NORTHAG	13673

Figure 12.

Figure 13 depicts the speed of shooting the first round at a target once it appears.[6] Being fast here would be a key to survival in combat. In CAT, remember, multiple (up to eight) targets may appear simultaneously. The U.S. M1 platoons were clearly faster than the Leo or Challenger equipped platoons.

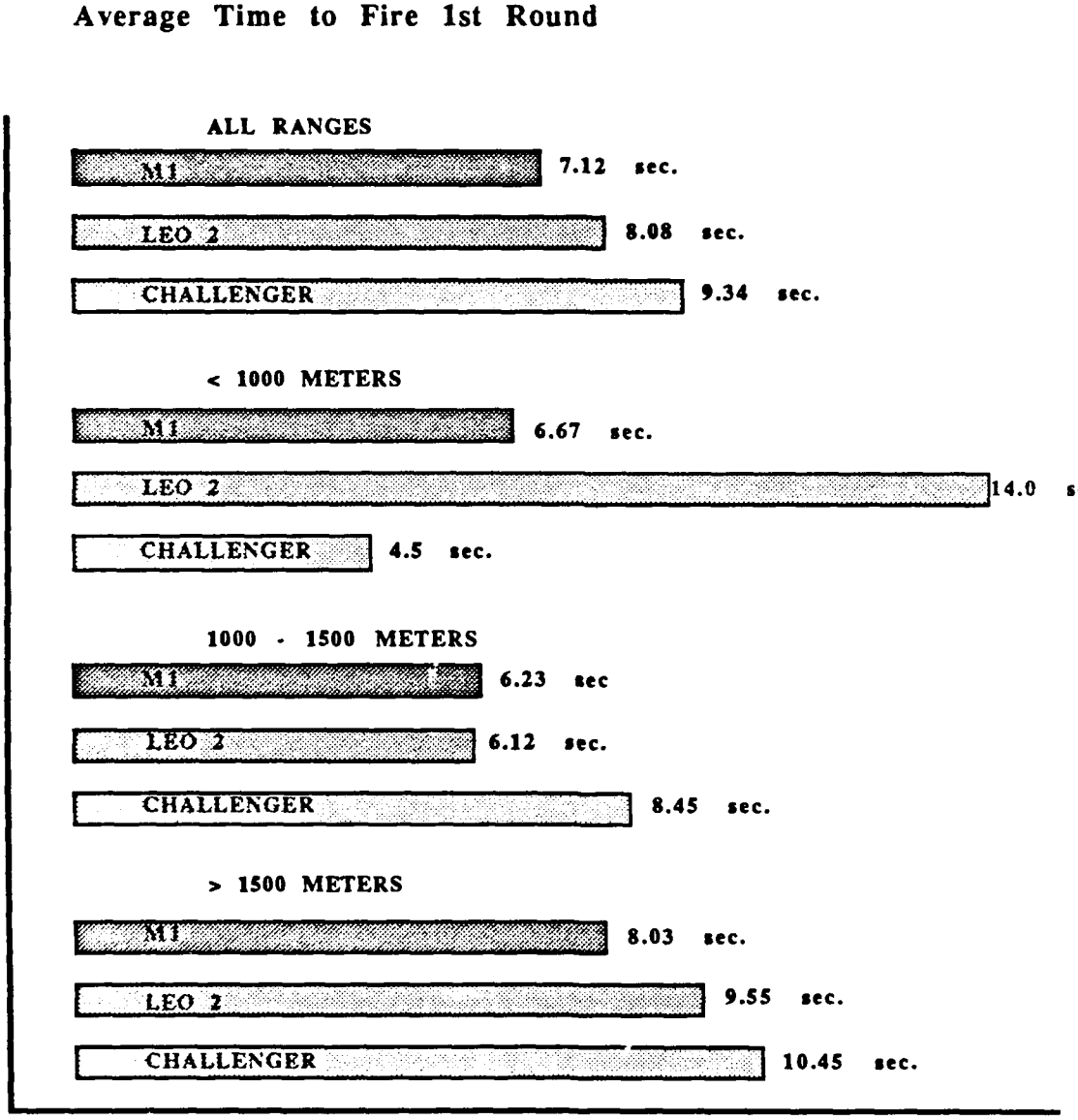

Figure 13.

Figure 14 depicts the average time to hit a target the first time (some targets are hit more than once; others are not hit and 40 seconds is added into the total hit time).[7] These figures are a measure of speed and accuracy. The U.S. teams averaged best.

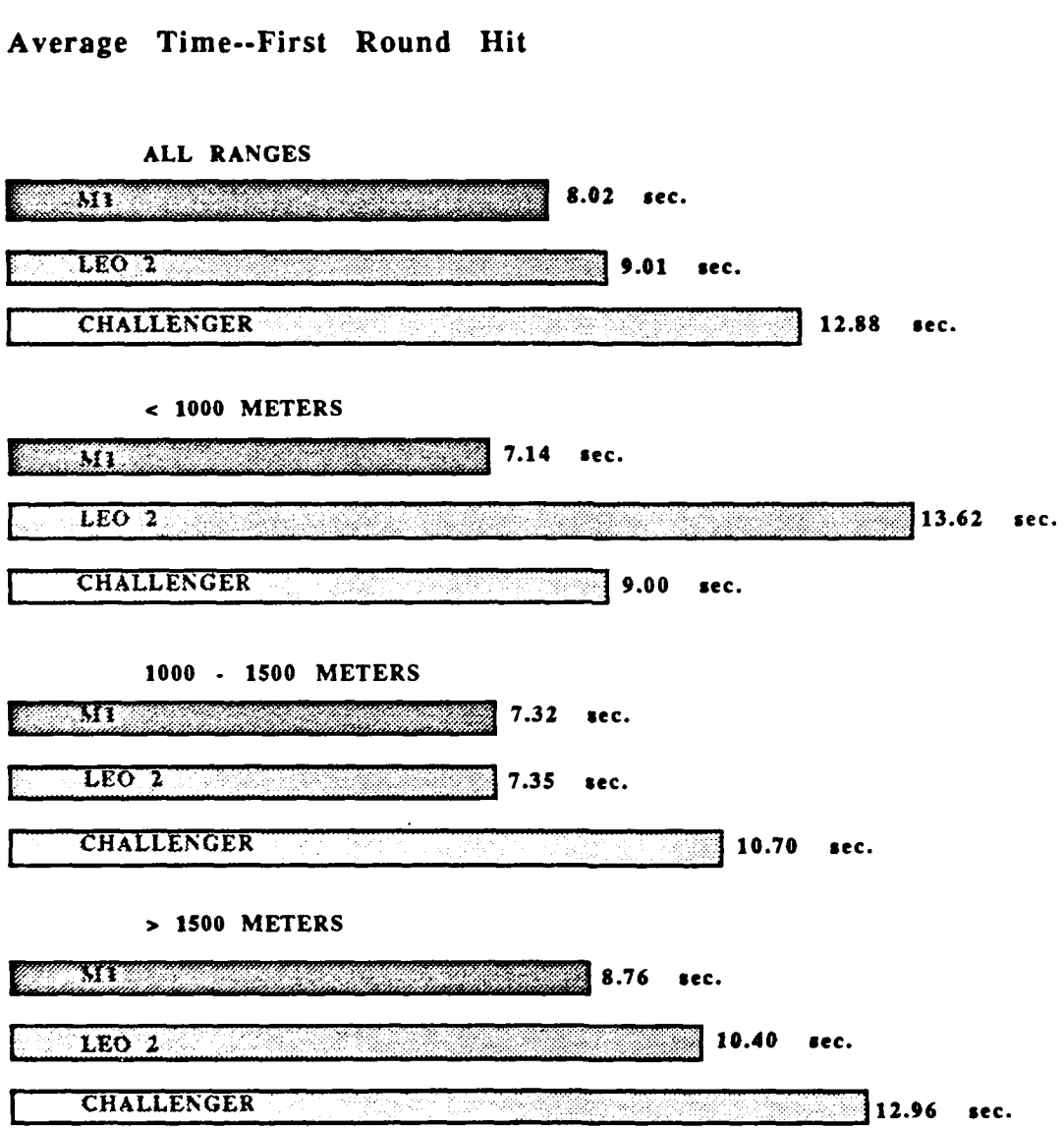

Figure 14.

Figure 15 shows the percentage of targets that were hit regardless of the number of shots it took to hit a target.[8] Misses reflect targets that were not seen, as well as those fired at but missed. Here, there is little difference among the M1 and Leo 2 platoons.

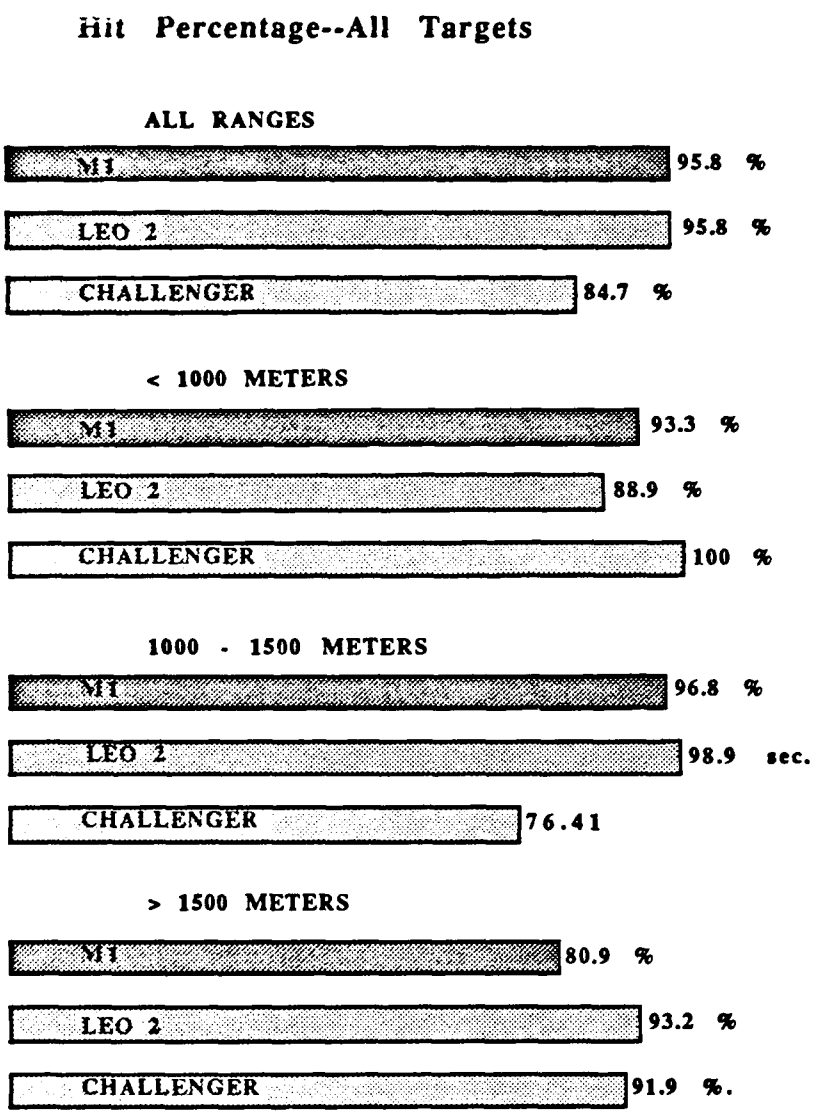

Figure 15.

Figure 16 depicts the average time to hit all targets presented.[9] If a target was not engaged or engaged but not hit, 40 seconds were added to the time score. A low time here indicates speed and accuracy. The U.S. platoons are best here.

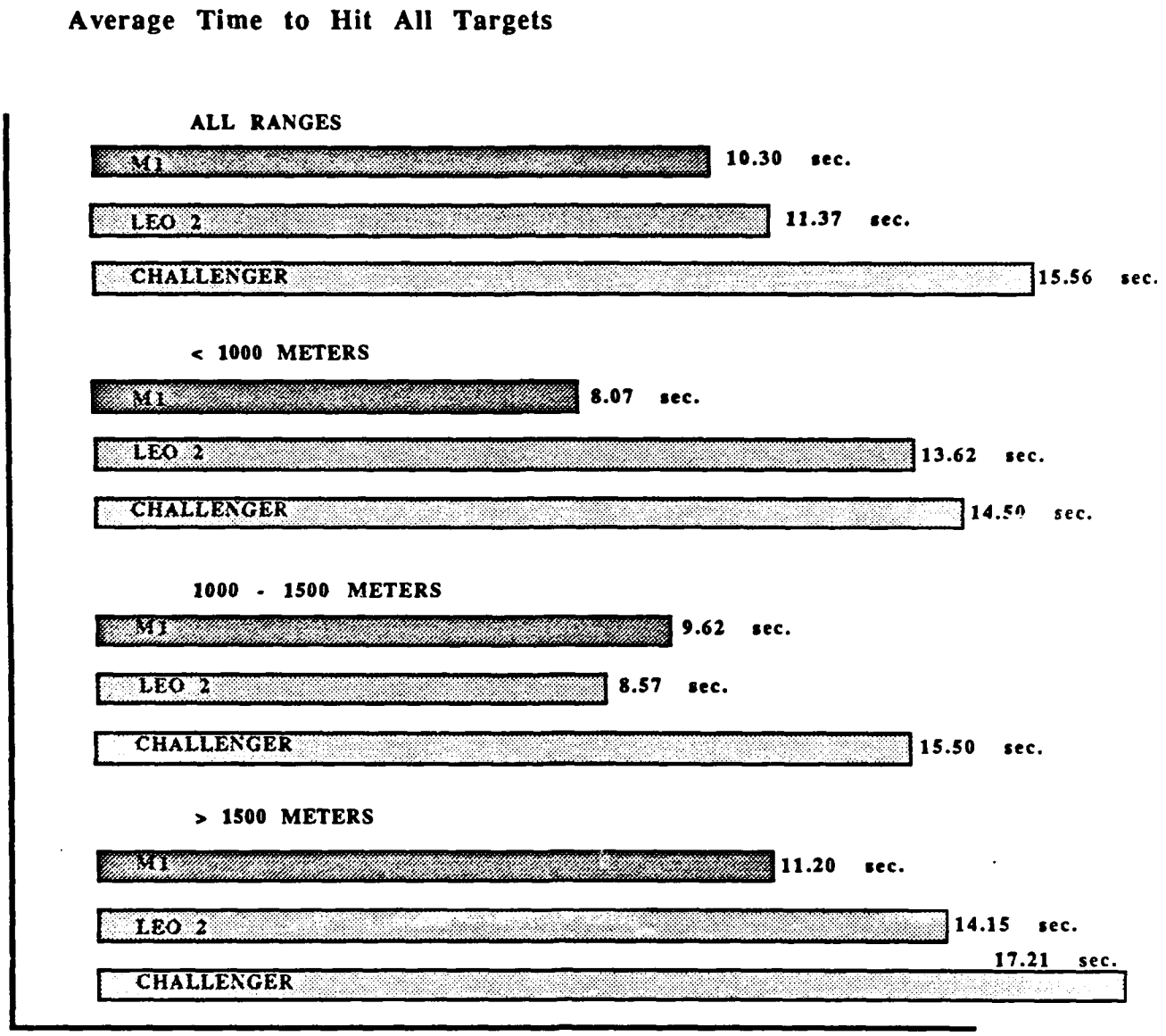

Figure 16.

Review of American Results

In the 1987 CAT final scores, two of the top three platoons are from D/4-8 Cavalry. All three of the middle platoons are from D/2-66 Armor. Two of the bottom three platoons are from A/3-64 Armor.[10] The excellent relative performance of D/4-8 Cavalry is fairly obvious in this display of the results. However, it is much more difficult to form conclusions regarding the relative performances of D/2-66 Armor and A/3-64 Armor.

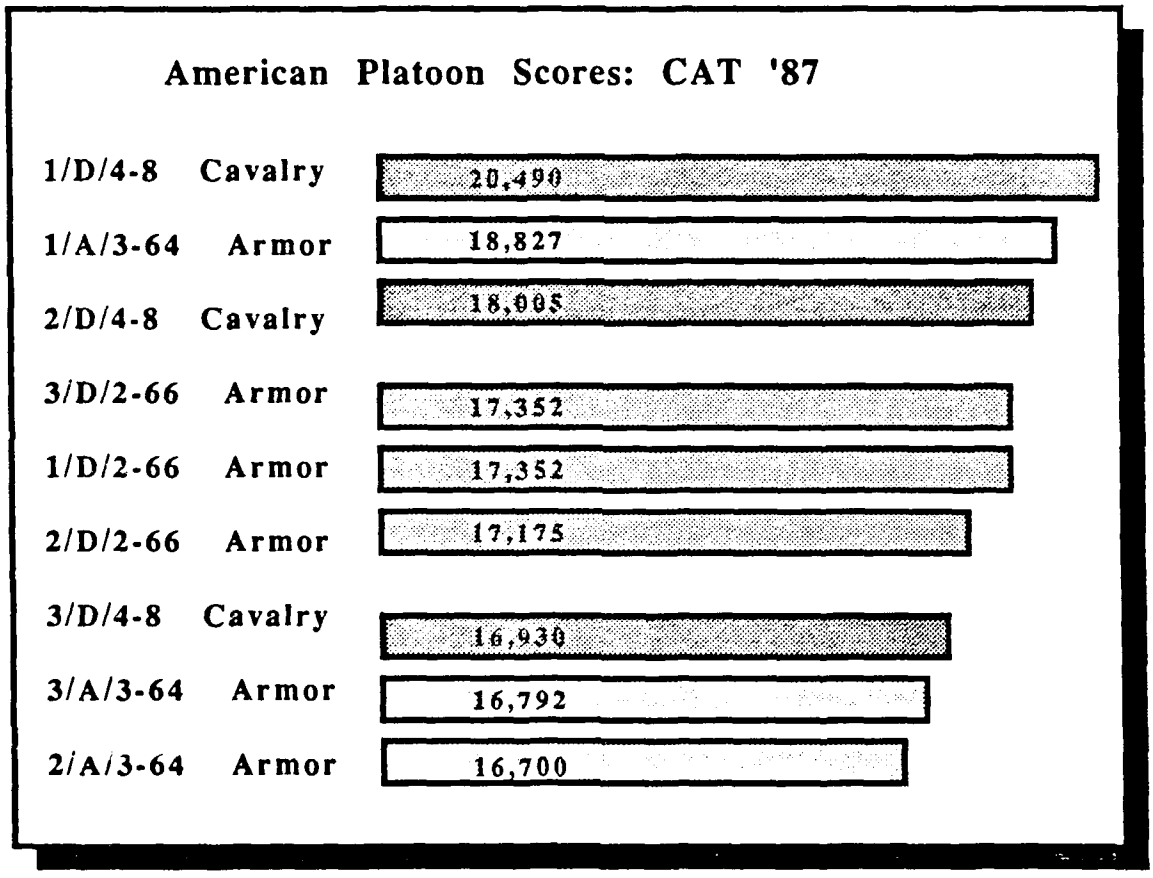

Figure 17.

If the platoon scores are combined into company averages, the superior performance of D/4-8 Cavalry is just as clear. However, the

relative positions of D/2-66 Armor and A/3-64 Armor are reversed, but with little difference in their average score.[11]

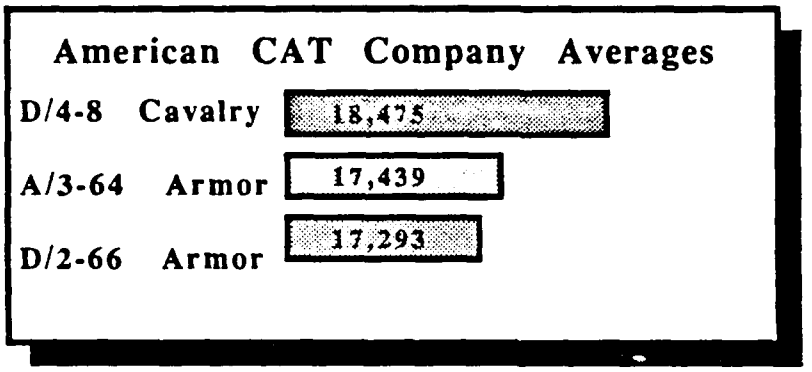

Figure 18.

As I did with the CAT '85 scores, I examine the scores by firing order. Those units firing first are firing with much less intelligence about target arrays and range conditions than those that follow--even if security is good and the scenarios are random. In CAT '87, the weather also was a significant negative factor affecting the early firing platoons. As an eye witness to the competition, I expected a display of the scores in order of firing might be revealing. Although I am unable to determine the specific mix of factors that influenced the trend of increasing scores as the contest grew old (excluding the British performance), the trend, below, is undeniable.

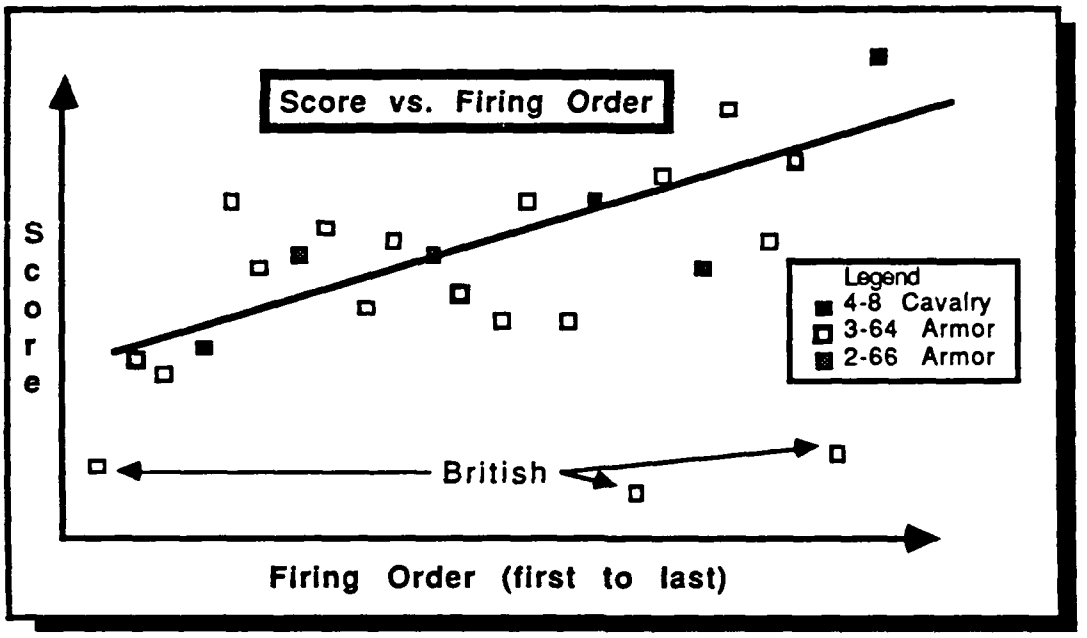

Figure 19.

Although such a display of the firing scores still verifies the superiority of at least one platoon of D/4-8 Cavalry, it also tends to insert some other significant considerations that will make it more difficult to sort out the key factors of building a CAT winner.

In summary, the results show a relatively good performance for the Americans across the board--and a clearly superior performance of 4-8 Cavalry relative to the other American units.

There should be factors that we can find in their preparation programs that account for this difference.

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[1] From transcripts of personal interviews conducted by Soldier's Radio and Television, February 1988.

[2] Headquarters, 4th Battalion 8th Cavalry, 3rd Armored Division Memorandum, Subject: After Action Report, 1987 Canadian Army Trophy Competition, 28 August 1987, Executive Summary.

[3] Ibid.

[4] U.S. Seventh Army Training Center Memorandum, Subject: Canadian Army Trophy, 14 September 1987, Tab A.

[5] U.S. Seventh Army Training Center Memorandum, Subject: Canadian Army Trophy, 14 September 1987, Tab A.

[6] U.S. Seventh Army Training Center Memorandum, Subject: Canadian Army Trophy, 14 September 1987, Tab A.

[7] U.S. Seventh Army Training Center Memorandum, Subject: Canadian Army Trophy, 14 September 1987, Tab A.

[8] U.S. Seventh Army Training Center Memorandum, Subject: Canadian Army Trophy, 14 September 1987, Tab A.

[9] U.S. Seventh Army Training Center Memorandum, Subject: Canadian Army Trophy, 14 September 1987, Tab A.

[10] U.S. Seventh Army Training Center Memorandum, Subject: Canadian Army Trophy, 14 September 1987, Tab A.

[11] Ibid.

Chapter 4

Manning a CAT Winner

The fundamental building blocks of an effective fighting force are its soldiers and their leaders who mold them into a cohesive team. CAT companies are no different. In general and across the active duty force, particularly in the armored force, the U.S. Army of the 1980's stands on firm footing here. But the U.S. Army's random distribution of its personnel assets to meet worldwide mission requirements is insufficient to concentrate the personnel talent required to win the Canadian Army Trophy. Therefore, the first task of the CAT '87 chain of command in each division was to identify their best soldiers and company grade leadership--then shift them into tank company and support unit organizations.

"There were a lot of things we looked at. Number one was--are they self-motivated? A lot of soldiers are just as good as another soldier is, but some soldiers have that extra quality where they will start themselves. They will do something on their own, or they'll ask questions on how something will work...and that's what we're looking for."[1]

SFC William Kemmits
Platoon Sergeant, 1st Platoon
D Company, 4-8 Cavalry
CAT '87

The timing of the reorganization is crucial, for it must be both synchronized with mission requirements and occur at least one year prior to CAT. All of the divisions recognized and understood this task -- but they took different approaches and had different capabilities to get this critical first step accomplished.

CAT '87--the U.S. Chain of Command

In peacetime, all U.S. armored forces in Europe are commanded by the Commander-in-Chief, U.S. Army Europe (CINCUSAREUR). However, the Canadian Army Trophy competition army group teams are established and administered during the competition according to the national composition of the allied wartime organizations, Central Army Group (CENTAG) and Northern Army Group (NORTHAG). Administrative Army Group team captains are appointed for each team, but they have neither command authority over their teams nor responsibility for organizing, training or supporting them. It is a national responsibility to prepare the tank companies to compete in CAT.

CINCUSAREUR, General Glen K. Otis, welcomed that responsibility. General Otis had been a division commander in Europe in the early 1980's when the memory of the poor U.S. CAT showings was fresh enough to call into question future American participation. Firmly believing that his army now had the quality soldiers and a modern tank capable of winning, he issued the emphatic challenge to his subordinate corps commanders and his staff to "WIN CAT '87"! Further, as the wartime CENTAG Commander, he made it clear that he wanted CENTAG to win--especially since NORTHAG had pulled an upset victory in CAT '85. He appointed the Commander, 7th Army Training Center as the single point of contact to coordinate the marshalling of all necessary training support. He directed USAREUR Deputy Chief of Staff for Logistics (DCSLOG) to logistically support the U.S. CAT teams. He solicited and received commitments from the Commander, U.S. Army Armor Center at Fort Knox, and the Program Manager, Tank Systems in Detroit to fully support the all-out effort to win CAT '87.[2]

Once the challenge to win was issued, the remaining command structure down to platoon level needed to be designated and filled. For CAT '87, the rules and conditions specified that six platoons (two companies) of the 12 CENTAG firing platoons and three platoons (one company) of the 12 NORTHAG firing platoons would be American. Furthermore, these companies were to be randomly selected from different battalions no earlier than 1 April 1987.[3]

Having learned the hard way that extraordinary numbers of highly skilled tankers and supporters are required to win CAT --

numbers unlikely to be found in a standard, well trained tank company or possibly a battalion -- , CINCUSAREUR and his corps commanders knew the competing companies must be formed and supported from a broad pool of talent. For the American components of the CENTAG team, the V Corps Commander selected the 3rd Armored Division (five tank battalions and a division support command) to prepare two teams for the random selection and the VII Corps Commander selected the 3rd Infantry Division (five tank battalions and a division support command) to prepare two teams. For the American component of the NORTHAG team, the commander of the 2nd Armored Division (Forward), a separate brigade with one tank battalion and one support battalion, directed 2-66 Armor to prepare two of its four tank companies for CAT.

The Parent U.S. Army Divisions

All of these American divisions and two of the battalions (2-66 Armor and 3-64 Armor) had previous CAT experience: however, the three-year European tour policy (which translates into roughly a 15 percent personnel turnover per quarter) pretty much decimates any concentrated experience.

The **3rd Armored Division** had competed unsuccessfully in CAT '81 (1-32 Armor), CAT '83 (1-32 Armor) and CAT '85 (3-32 Armor). Embarrassed by its next-to-last finish in CAT '85, when it was the only U.S. team without modern tanks (M60A3 rather than M-1), the division was determined to write a different script in CAT '87. The Division Commander, Major General Thomas N. Griffin, Jr., assigned the CAT '87 mission to his tank-heavy (two tank battalions) 2nd Brigade stationed at Gelnhausen. This choice would take advantage of the relative concentration of tanker, tank and support assets. The General simultaneously tasked his G-3, Lieutenant Colonel John Abrams--son of the late General Creighton Abrams, whose name the M-1 Abrams tank bears,-- to coordinate and focus all division assets required to win CAT '87. The 2nd Brigade Commander, Colonel John S. Luallin, commenced the task of reorganizing his two tank battalions, 1-33 Armor (later redesignated 3-8 Cavalry, but not randomly selected to compete) and 3-33 Armor (later redesignated 4-8 Cavalry, the CAT '87 winner). Each battalion would be tasked to organize and train one company team for CAT. One of these trained companies would be randomly selected on 1 April 1987 to compete in June 1987.

In the early stages of preparation and based on previous performance, the 3rd Armored Division representative was considered a "long shot" to win CAT '87.

The **3rd Infantry Division** also had the experience of CAT competition under its belt. A Company, 3-64 Armor was a member of the winning CENTAG team in CAT '83 and nearly won CAT '85 with the second highest platoon score and the high tank company score. The Division Commander, Major General George Stoetzer , assigned the CAT '87 mission to his tank-heavy (two tank battalions) 1st Brigade stationed at Schweinfurt. This was an obvious assignment that also took advantage of concentrated tanker, tank and support assets. These two tank battalions, 1-64 Armor and 3-64 Armor , were consistently among the best shooting tank battalions in USAREUR in annual tank gunnery qualification at Grafenwoehr. The CAT tradition and experience lived in 3-64 Armor. They knew they were so close to total victory in CAT '85 that they would not let victory escape again-- if they could just survive the random selection process.

Based on their previous CAT experience and success--and their consistently high tank gunnery qualification performance, the 3rd Infantry Division representative was considered the favorite to gain an American victory in CAT '87.

The **2nd Armored Division (Forward)** was also long on CAT experience. Its only tank battalion, 2-66 Armor, competed in CAT '83 (1st in NORTHAG, 3rd overall) and CAT '85 (2nd in NORTHAG, 4th overall). The Division (Forward) Commander, Brigadier General William F. Streeter, had no larger concentration of tanker, tank and support assets to choose from other than his 2-66 Armor and his 498th Support Battalion, so the CAT '87 mission passed automatically to his veterans. General Streeter also had at least two other important missions that would tend to diffuse the CAT preparation: REFORGER '87, in which 2 AD(F) and 2-66 Armor would play key roles, must be thoroughly rehearsed in Spring-Summer '87 and executed in Fall '87; combined arms training, including a major NATO maneuver exercise in Fall '86, which required the tank assets of 2-66 Armor and the support assets of the 498th Support Battalion. Even so, there was a belief on my part (and other's) that the disadvantages of a narrow asset base and multiple conflicting missions could be overcome by the advantages of cohesion, CAT experience and gunnery competence within the one tank battalion. After all, 2-66

Armor is consistently among the top qualifying tank battalions in USAREUR and was the top shooter in 1986. But the random selection rule would place a heavy burden on the battalion. From its four tank companies it had to organize and train two CAT companies! Furthermore, since A Company was a COHORT company due to disestablish in February 1987 (COHORT is a unit specially organized under a Department of the army program), and B Company had an annual, high visibility, critical mission that required stability and specialized training, the Battalion Commander's choices were realistically limited to his C (the CAT '83 and CAT '85 competitor) and D companies.

Based on its 1986 qualification gunnery performance and its solid CAT experience (many former competitors from CAT '85 remained in the battalion, primarily in C Company), the 2-66 Armor representative was considered a reasonable bet to win CAT '87.

Just as the pre-season college football polls often have little bearing to the seasons' final national rankings, prior CAT experience and the early "betting" odds would be a minor contributor to the CAT '87 results. The winner would emerge as the product of a well organized, heavily supported strategy.

The Battalion Commander and Staff

In the U.S. Army, the initial responsibility to build the CAT company and its organizational support rests squarely on the shoulders of the tank battalion commander and his battalion staff. This responsibility is an honor, but in turn places an extraordinary burden on the commander and his staff. Already faced with the standard challenges of all other similar USAREUR battalions, he also must build and prepare a unit to carry the American colors in international competition. He is expected to do this with little, if any, augmentation of personnel at battalion staff level. Yet the coordination of training and the logistical support of a CAT company over a year's time requires precision seldom expected of a battalion in its normal conduct of business.

Although there may be many factors (past CAT experience, division missions, personalities, rules and conditions, etc.) that determine which battalions will prepare a team for CAT, once a battalion is designated, the battalion commander (with input from his Command Sergeant Major) should be in the best position to assess and select the leadership of the CAT company. The same is true

regarding the selection of his key assistants--the battalion executive officer, the battalion S-3, and the battalion master gunner. This is so because he should know and understand the strengths and weaknesses and "chemistry" of the officer and noncommissioned officer structure in the battalion. Others might be able to pick the individual "superstars", but the battalion commander best knows the formula to combine the talent. A significant consideration, often overlooked by outsiders but not by the battalion commander, is that much of the best talent in the other companies will be stripped out to form the CAT company--potentially leaving a very weak structure in the remainder of the battalion that will eventually detract from the CAT mission. This is not to say that outside advice and guidance is not helpful, but it should not dominate the selection process.

Once he has selected and positioned the company leaders (down to platoon sergeant level), most of the team-building, training and administration responsibilities for the company will transition over time to the company commander. The battalion commander will then focus his attention in four major areas: providing the company commander with every resource (personnel, equipment, training and logistical support, etc.) he requires to win; shielding the company commander from all the well-intended "good ideas" from outside sources that he does not need to win; ensuring quality control of all company training and logistical activities; and preserving the integrity of his battalion as the majority of the command attention and resources flow to the CAT company, yet the remainder of the battalion absorbs the normal mission requirements.

In view of the significant role of the battalion commander in the CAT process, it is interesting to note that the selection and timing of the rotation of the CAT battalion commanders in the U.S. Army is practically independent of the CAT competition. Commanders are selected for a two-year command assignment based on past performance and potential for command by a central command selection board in Washington. Few of the members of the board would know what CAT is--much less give special consideration to it as a selection criterion. In fairness to the board members, it is also unlikely that "top-of-the-pile" officer efficiency reports on a lieutenant colonel or promotable major would communicate any CAT- specific information to the selection boards.

Once new battalion commanders are selected, they are "slated" by a separate process against vacancies that come open in a given

fiscal year. Once again, it is highly unlikely that CAT receives any visibility in this process. For the CAT '87 battalions the rotation worked out this way: 4-8 Cavalry and 3-64 Armor--battalion commanders arrived approximately coincident with CAT company formation and departed a year after the competition; 2-66 Armor--battalion commander arrived one year in advance of CAT company formation and departed after competition. My analysis of the commanders role would favor the latter circumstance if given a choice, yet the winner was 4-8 Cavalry. Closer analysis of that unit's organization and personality mix, which I am unable to provide, would likely reveal the compensating factors.

My point is that in spite of our recent CAT competition success, one of the key players, the battalion commander, is on the scene by "the luck of the draw". Will the continuation of this process be good enough to win in the future? The question merits an answer by our generals.

Given all of this, there is one final thought regarding the role of the battalion commander. Throughout the entire CAT preparation and competition process, the battalion commander needs a total commitment (translated--extraordinary commitment of available resources) to win CAT on the part of his superior commanders. The degree to which this commitment exists will have a direct impact on the outcome of the competition.

Company Leaders

Selection of the CAT company leaders--the company commander, executive officer (XO), first sergeant, platoon leaders, platoon sergeants and company level master gunner--is the first and most critical step in building a successful CAT competitor. These selections must be made early (about a year prior to CAT) and they must be made correctly. There will be little time to correct errors in judgement later. This leadership team will have, at most, about a year to assemble a group of talented, but diverse, individual soldiers and mold them into a tank force capable of exceeding U.S. Army gunnery standards under the stresses of international competition. To achieve winning CAT gunnery standards, the company will often operate and train autonomously as its parent battalion pursues other missions. The CAT companies' soldiers will spend more time away from their families and home base than their other battalion mates, thus further creating the potential for personal and family stresses.

Only extraordinary young officers and noncommissioned officers will be capable of successfully meeting these challenges.

The Company Commander, XO and First Sergeant

4-8 Cavalry

The 3rd Armored Division and 4-8 Cavalry had the opportunity to "think big" regarding all CAT personnel matters --and they did it-- starting with the selection of the CAT company commander, XO and first sergeant. From the beginning of the organization process, it was clear that all of the personnel assets of the division would serve as a pool to be tapped to build the CAT teams of both 3-8 Cavalry and 4-8 Cavalry. Previous CAT experience was considered a desirable commodity--but not a prerequisite for team membership. However, as early as eighteen months prior to CAT '87, division units were required to submit rosters of personnel with previous CAT experience.[4]

In the case of the company commander, the 4-8 Cavalry determined that while there were many "nice-to-have" attributes (seniority, CAT experience, M1 technical experience, etc.), there were two essential qualities the CAT company commander must have. First, he must be a proven trainer. This conclusion was reached based on the careful study of past CAT after action reports that seemed to show that training was the key to winning CAT. Second, he must know the battalion--its people and its operating procedures within the brigade and division. This quality was based upon the realization that even though there would be some volunteers from outside the battalion, the vast majority of the CAT competitors would eventually come from within the 4-8 Cavalry.[5]

Accordingly, Captain Joseph R. Schmalzel was selected (precisely who made the choice is unknown) as Company Commander, D Company, 4-8 Cavalry. Considered by his superiors as one of the finest officers in the brigade, he had solid tank gunnery training and maintenance experience and he had served for 14 months as the battalion's S3 Air (often responsible for planning, executing and supervising training programs). He was short on "hands-on" M-1 experience and had no previous CAT experience, but was committed to win CAT '87 if given the opportunity.[6]

His designated XO, 1LT Joseph Weiss, was strong on "hands-on" M-1 experience that the company commander lacked. [7]

Similarly, First Sergeant Gary Fravel was selected to serve as Captain Schmalzel's right hand man. The first choice of the battalion Command Sergeant Major, 1SG Fravel was a noncommissioned officer with CAT '81 experience as a tank commander.[8]

Once the company commander and first sergeant were approved by the brigade commander, they would play key roles in selecting the remainder of the company leadership team as well as building the company.[9]

3-64 Armor

Although the 3rd Infantry Division and 3-64 Armor emphasized many of the same features as the 3rd Armored Division in selecting the CAT company leaders, there were at least two significant differences in their approach. First, for reasons not disclosed in after action reports, the personnel pool from which to form the CAT teams for both 1-64 Armor and 3-64 Armor was limited to the 1st Brigade assets, rather than the entire division. Second, the 3ID placed much heavier emphasis on prior CAT experience as a selection criterion.[10]

In searching for his CAT company commander, the 3-64 Armor battalion commander emphasized two essential qualities: superior knowledge of the entire M-1 Tank--better than any other in the company; seniority and maturity.[11] Accordingly, the 1st Brigade Commander personally selected Captain John Tisson to command A Company, 3-64 Armor. Captain Tisson had previously participated in both CAT '83 and CAT '85--and he had demonstrated the maturity and expert skills required to build and train a potential CAT winner.[12]

Likewise, the credentials of the designated XO, 1LT Welsch, were very impressive. He served as a platoon leader with 3-64 Armor in CAT '85 and possessed substantial technical knowledge of the M-1. Finally, his seniority (he was promoted to Captain just prior to CAT '87) was an extra bonus and it is likely that he was being groomed to command a team for CAT '89.[13]

Although the designated first sergeant, 1SG Walker, had no previous CAT experience, he was selected based on his personable, low-key leadership style. This attribute would prove invaluable, as it would tend to keep the company relaxed during the intense preparation and competition phases.[14]

2-66 Armor

The 2nd Armored Division (Forward) and 2-66 Armor sought basically the same characteristics in its search for CAT company leaders as the 3rd AD (4-8 Cavalry) and the 3rd ID (3-64 Armor). However, the requirement to build two CAT companies from the assets of a single battalion would prove to be a most demanding challenge. This meant that 2-66 Armor must produce two company commanders, XO's and first sergeants; and six platoon leaders and

platoon sergeants capable of competing with and out-shooting NATO's best. To accomplish this would require innovative approaches and substantial risk-taking on the part of the Battalion, Brigade and Division (Fwd) Commanders; extraordinary commitment and performance by those selected; and unselfish cooperation and support from the remaining leaders in the 2-66 Armor. We thought we could do it!

My selection process for the two CAT company commanders began in January-February 1986, and was heavily influenced by two overriding concerns--finding the required skills (very similar to 3AD and 3ID specifications) from a relatively narrow personnel pool--preserving the integrity and operational viability of the remainder of the battalion. The process would be a long one, and there would be slightly different considerations for the commanders of the two companies that won the right to compete in CAT '87 by virtue of their April 1986 tank gunnery qualification scores-- C Company and D Company. With the CAT companies decided, I reached a major milestone in the company commander selection process in April 1986.

In my mind, there was no debate concerning who should command and prepare my "Charlie" company for the CAT '87 competition. Captain Armor Brown. had assumed command of C Company in July 1985, immediately after its participation in CAT '85. He and his new XO, 1LT Bill Walker. (CAT '85 platoon leader) rebuilt the company around a strong nucleus of the remaining CAT competitors. And one must understand that C Company simply assumed they would be the CAT '87 competitor, so many of the noncommissioned officers extended and positioned themselves in the company for June 1987. The company set high standards for the rest of the battalion in almost everything during the next year, including a truly brilliant performance at qualification gunnery in April 1986, where it was the highest shooting tank company in USAREUR for 1986. I felt Captain Brown possessed sufficient personal skills in all the required areas--and any of his weaknesses would be more than compensated for by the strong bonds of cohesion and esprit he had built in the company. Additionally, if he were not selected, it would require me to shorten his command assignment to one year (a potentially career damaging move) or change company commanders in the January '86 time frame--only six months prior to CAT '87 and right in the middle of the training period.

On the other hand, the considerations were quite different for selecting the commander of the second CAT company, which turned out to be my "Delta" Company. We had analyzed the " Delta" situation in February. Captain John Hanna., an experienced and very successful company commander, was scheduled to rotate back to the United States in September 1986, so he would have to be replaced. Further, much of "Delta" Company would also be leaving prior to CAT '87, so the company would have to be "rebuilt" from battalion assets during the early summer of 1986. Even though Captain Hanna would not take the company to CAT '87, I considered him fully capable of building the company and handing it off to his yet undetermined successor. He knew the company and the battalion personnel very well--and I had no captain in hand that would be available to lead "Delta" to CAT '87.

Therefore, I had to develop some alternatives in the February-March time frame. I had three highly skilled, very junior captains in the battalion capable of doing the job. There was another in the brigade staff. Unfortunately, they were ineligible to command because they had not attended the Officers Advanced Course (a six month course). Two of these were near the end of their three-year tours and were programed to attend. Perhaps there would be a way to get one of them reassigned to 2-66 Armor afterwards. There was also a possibility to send one of the other two on temporary duty to the Advanced Course and return him to 2-66 Armor to command D Company. I also had a promotable 1LT in the battalion in this last category. I would spend a great deal of time talking with each of these officers about the "Delta" command--and I asked them to speak with their wives about it.

After all of these discussions--and considering the other future requirements for captains within the battalion, newly-promoted Captain Dave Shutt. and I agreed (in March just prior to his departure) that he was the man for the job and that we would make every effort to get him reassigned to command the second CAT company upon his graduation from the Infantry Advanced Course (and M-1 Tank Commanders Course) in August 1986. This reassignment effort would prove to be a time consuming one with an uncertain outcome.

Captain Shutt was a selection worth the persistence it would take to get him reassigned. Having served three years in 2-66 Armor as a tank platoon leader, scout platoon leader and Headquarters Company XO, he had earned a reputation as a highly

skilled and well respected young officer. I was convinced that his knowledge of the battalion's personnel, war plans, and training areas, combined with a well established working relationship with his battalion commander and most of his future fellow company commanders, would more than offset his lack of seniority. Additionally, he was very familiar with the CAT competition, even though he had not personally competed. He had been in the battalion during its preparation of C Company for CAT '83, and had assisted the scoring and record keeping of the company. All of these attributes would also give him a quick "start-up" time in command relative to an officer new to the battalion. This would be especially important, since the circumstances caused the change of command for "Delta" to occur in September 1986, only nine months before CAT '87.

While I was generating my company commander alternatives, General Streeter. was justifiably concerned with the narrow selection pool for the two commanders and six platoon leaders. After listening thoughtfully to my considerations and alternatives, he deferred his approval of my selections and directed me to contact Armor assignments branch at the Military Personnel Center (MILPERCEN). in Washington to see if they could help with the company commander issue as well as platoon leaders.

After several discussions with assignment officers at MILPERCEN and many weeks of consideration, we could not develop better alternatives. While identification and validation of the required skills through this source was difficult, at best, it was probably too late to get them on orders for a timely arrival from the States. However, MILPERCEN did agree to give "consideration" to reassigning Captain Shutt if it became "absolutely necessary".

By June, the passage of time had finalized the selections of Captains Brown and Shutt--and MILPERCEN had agreed to send Captain Shutt back to 2-66 Armor.

Both companies needed new XO's. They were selected based on the following criteria: maturity, leadership and compatibility with the company commander; demonstrated expert skill as a tank platoon leader, with emphasis on gunnery and maintenance--for they would be a back-up platoon leaders in an emergency. 1LT Jeff Ingram was assigned to "Charlie" and 1LT Mike Baker was assigned to "Delta".

The first sergeant situation was somewhat different for each company. In each case, the same high standards of leadership skill and technical expertise sought by the other CAT teams was needed. Although quite junior, 1SG Travis was selected to remain the first sergeant of C Company. By June 1986, he had served well for four months as a platoon sergeant in C Company and had served six months as Captain Brown 's hand-picked first sergeant. 1SG Travis knew the "Charlie" soldiers and NCO's well, and he and Captain Brown were an effective team. We chose recently promoted 1SG Swift to move from A Company (our COHORT company) to become the "Delta" first sergeant. He had served as a platoon sergeant in A Company for more than two years. He had all the required skills--plus he knew well the soldiers and NCO's in A Company (about a platoon) that would also transfer to "Delta" in July 1986.

Platoon Leaders, Platoon Sergeants. and Master Gunners

4-8 Cavalry.

D Company, 4-8 Cavalry was provided the assets to organize and train four tank platoons for CAT, rather than the standard three platoons. One would be competitively eliminated in March 1987 (more discussion on this strategy later). Therefore, the battalion needed to select four platoon leaders and four platoon sergeants (master gunners discussed separately). The selection criteria were: leader experience and performance with emphasis on individual and platoon gunnery results; platoon battle run (TT X) results; demonstrated ability to supervise and conduct training; and a firm commitment to an armor career. The battalion reviewed all of it's lieutenants platoon sergeants and interviewed two volunteer platoon leaders and several NCO's from other battalions. All four platoon leaders (three 1LT's and one 2LT) were selected from within 4-8 Cavalry. Only one platoon sergeant came from another battalion.[15]

Master Gunner.s are specially trained NCO's that have met stringent prerequisites of unit leadership and gunnery skills and have graduated from a certified three-month course at the U.S. Armor School at Fort Knox. They are experts in tank gunnery, gunnery training and turret and fire control maintenance. The really good ones are recognized leaders. They are in short supply.

The 3AD allocation of its master gunner assets to its CAT companies was a clear indicator of its commitment to win CAT '87. Normally, a battalion will have a battalion level master gunner in the S-3 shop and each tank company will have one authorized in the company headquarters. 4-8 Cavalry ensured that each platoon of D Company had a master gunner in addition to the normal company and battalion authorizations! They selected their company master gunner, SFC Tony Smith., based on his extensive platoon experience. He was also a recent graduate of the master gunner school with many Fort Knox contacts.[16]

3-64 Armor.

The 3-64 Armor did not specify in their after action reports the details of their selection process and criteria (other than those for company leaders in general) for their platoon leaders, platoon sergeants and master gunners. They clearly wanted the best available. However, it does appear that all of their selections were "homegrown" in the battalion. Also, it is significant to note that all of the selected platoon sergeants had been tank commanders in CAT '85.[17]

2-66 Armor.

We recognized very early that the requirement to select six CAT quality platoon leaders from one battalion was going to be a major challenge. At any one time, a normal tank battalion will have approximately 22 Armor lieutenants. Eight of those, almost always the most capable and most experienced (as determined by at least one year of service as a tank platoon leader) will be currently serving as the four tank company XO's, the Headquarters Company XO, the Support Platoon Leader, the Mortar Platoon Leader, and the Scout Platoon Leader. A battalion will have great difficulty functioning well under even routine circumstances without high quality officers in these positions. Of the remaining 16 Armor lieutenants, about half will have been in the Army less than one year and in the battalion less than six months. They are untested. The situation is further complicated by the three year overseas tour--that is, at any one time, about a third of the lieutenants will have less than one year remaining on their tour. The bottom line was that in February 1986, 2-66 Armor had to fill the six CAT platoon leader slots and the other eight key lieutenant positions from a realistic pool of about 15-16

lieutenants. We would obviously have to take some risks on some relatively untested young officers.

We used the March-April 1986 tank gunnery qualification. period at Grafenwoehr to eliminate some of the uncertainty. This was a genuine "trial by fire" for the incumbent platoon leaders and helped to finalize our choices based on individual and platoon results. There was only one exception. One of our most skilled lieutenants, after his being selected, opted out of the chance to compete in CAT and forced us to examine our untested lieutenants more closely. Of the six platoon leaders we selected by May 1986, one (1LT Bob Steele , C Company) had been a tank platoon leader about a year, two (2LT Ralph Moore , C Company and 2LT Steve Witkowski , D Company) had been tank platoon leaders about five months, and three (2LT Joel Williams , C Company; 2LT Ken Carroll , D Company; and 1LT Jeff Erickson , D Company) were brand new tank platoon leaders (although Erickson had served his first year as the Mortar Platoon Leader). Personally, I felt very confident in three of these and considered the other three a moderate risk, for which I developed back-up replacement contingency plans.

The requirement to select six CAT platoon sergeant.s was just as important as the selection of the platoon leaders, but in many ways it was a much easier task. All three of the incumbent platoon sergeants in C Company as of April 1986 (SFC Ronald Jones , SSG James Miller , and SFC Reggie Wheeler) had previous CAT experience as tank commanders. Their assignments in 2-66 Armor were stabilized through June 1987 and their company commander, Captain Brown, strongly recommended their retention for CAT '87 to capitalize on their experience and maintain company cohesion. I agreed.

The platoon sergeant situation in D Company was quite different. After careful analysis, we agreed that all of the platoon sergeants in the company must be replaced to prepare for CAT '87. We reviewed the skills, performance, experience and availability of all remaining Sergeants First Class (SFC) and senior Staff Sergeants (SSG) and selected the following: SSG P. Rodrigues, acting platoon sergeant in D Company, would move to 1st Platoon and be teamed with 2LT Carroll; SFC Norman Hardin., platoon sergeant and master gunner in B Company, move to 2nd Platoon and be teamed with 1LT Erickson; SFC William Hoback., senior platoon sergeant in A Company, would move to the 3rd Platoon and team with 2LT Witkowski., also moved from A Company.

By the summer of 1986, 2-66 Armor and 2AD(Fwd) found themselves short of CAT quality master gunners. But most of the ones we had were excellent, and I believed they would be sufficient to cover all CAT requirements as well as the remainder of the battalion's needs--if they could all be exclusively focused on the missions of the battalion.

The C Company master gunner., SFC Robert Wolford., was the company master gunner for CAT '85. He was highly skilled, thoroughly respected by his company and totally committed to ensure that the 2-66 Armor representative won CAT '87--no matter which company was randomly selected to compete. SFC Norman Hardin, a very bright NCO long on troop leading experience, would inherit the heavy responsibility of serving as both the D Company master gunner and the 2nd Platoon Sergeant. My battalion level master gunner, SFC Powell., was also excellent and made significant contributions in the early stages of CAT preparation. But SFC Powell was scheduled to rotate back to the U.S. in February 1987, only a few weeks prior to the battalion's deployment to Grafenwoehr for qualification gunnery and the bulk of the CAT live fire training.

I needed a replacement for SFC Powell badly. When a normal tank battalion, now equipped with both Bradley Fighting Vehicles and M-1 tanks, prepares for and shoots qualification gunnery, the battalion master gunner is mentally and physically consumed in the process. With the CAT training superimposed on our qualification gunnery, it would be difficult to exaggerate the significance of the battalion master gunner's role.

Early on, I thought I had a more than satisfactory solution to fill the 2-66 Armor battalion master gunner position, but I did not control the asset. SFC Butler, former platoon sergeant in B Company, then assigned to the brigade G-3 Training, was a senior, bright M-1 master gunner. He knew the battalion leadership well and knew many of the NCO's that transferred from B Company to D Company to train for CAT '87. However, at the G-3 level, he was performing at least two key functions. He was doing much of the early CAT resource coordination and he was assisting the Bradley-equipped infantry battalions prepare for their first qualification gunnery period.

The Brigade Commander, Colonel Tommy Baucum. and I discussed the possible reassignment of SFC Butler to the 2-66 Armor several times and at great length. In the end, Colonel Baucum decided that SFC Butler could better serve the brigade as a whole, including 2-66 Armor, by remaining on the brigade staff. Given that decision, SFC Wolford. served as both the battalion master gunner and the C Company master gunner during the critical battalion qualification gunnery and CAT live fire period in March 1987. Then, when C Company was not selected for the CAT competition, I moved SFC Wolford to the battalion master gunner position.

Other Team Members

After selection of the company leaders, came the difficult task of choosing the remainder of the company team. The leaders would play be key in this process. The remaining team members would be the men that would drive the tanks, load the ammunition, aim and fire the guns and precisely perform the myriad of other tasks required to seriously compete.

"Someone who knows their job, someone who's willing to put forth the effort and won't quit when the first thing goes wrong or when they miss a Friday or Saturday night out with their girlfriend, or something."[18]

PFC Steven Kuhn
Driver, D14, 4-8 Cavalry
CAT '87

Each unit would use a selection process particularly tailored to its own strategy and resource constraints. And even though the best available soldiers were picked, one would be surprised how representative they were of the American armored soldier.

4-8 Cavalry.

The original strategy of the 3AD was to form two six-platoon CAT companies, one in each of the two tank battalions (3-8 Cavalry and 4-8 Cavalry) of the 2d Brigade. These would be gradually whittled down (by individual soldiers, not crews or platoons) to the standard three-platoon company through a competitive process by late March 1987. The personnel and equipment assets of the entire divi-

sion were potentially available to implement this concept. However, this plan was eventually deemed unworkable due to personnel, equipment, logistic support, training resource and various administrative constraints. However, the battalion did adopt and resource a very bold two four-platoon CAT company organization.[19]

The CAT company commander and first sergeant were responsible for selecting the remaining tank commanders, gunners, loaders, drivers and support personnel. They made their final selections only after personal interviews of all candidates.

"The CO would take us in and the First Sergeant would take us in. They gave us a long speech--like you're fixing to go to hell--you're in the butt of the world, and we're going to dog you and it's not going to be fun. And the people that say, that's what I want; I want a challenge--he accepted those people."[20]

SGT Shaun Banks
Driver, D11, 4-8 Cavalry
CAT '87

Most of the battalion's candidates came from a list comprised of recommendations of other company commanders and first sergeants and based on the following criteria:[21]

- 0 True volunteer--no pressure to compete.
- 0 No indication of serious financial, family, drug or alcohol problem.
- 0 Recent (July 1986) tank gunnery qualification. scores.
- 0 Screening test results (exercises 324111, 342111, 333110 and 346311) on the Unit Conduct of Fire Trainer (UCOFT.). A minimum acceptable rating of B (second highest) in all scored areas (target acquisition, reticle aim and systems management) was established. The battalion also reviewed each crew's position on the regular UCOFT matrix.
- 0 Special qualifications and experience such as Excellence-in-Armor(EAI). track, GT score, Skills Qualification Test.

score, master gunner experience, previous CAT competition, others.

The remainder were "walk-ons" that expressed a strong desire to compete, but had not made the original list for some reason. About 15 % of those selected were in this category.[22]

The end result was a team comprised mainly of soldiers from the 4-8 Cavalry. Of the 48 platoon members that actually competed in June, 44 were from 4-8 Cavalry (including all of the platoon leaders, platoon sergeants and tank commanders). The other four were from outside the brigade.[23]

3-64 Armor.

In contrast to the 3AD and 4-8 Cavalry, the 3ID and 3-64 Armor took a more conventional approach in organizing its two CAT companies. These companies were organized as the standard three-platoon companies and the asset pool was limited to the resources of the 1st Brigade rather than the entire division. Even with this apparent limitation, great emphasis was placed on getting the best soldiers for the CAT team. The 3-64 Armor used the following considerations in selecting its remaining team members:[24]

- 0 Previous CAT experience. and/or tank gunnery qualification. scores for tank commanders and gunners.
- 0 Knowledge of the tank systems.
- 0 Leadership and trainer skills.
- 0 GT scores (indicator of trainability).
- 0 Discipline and appearance.
- 0 Team player attitude.
- 0 Ability to perform under pressure.
- 0 General competence and self confidence.

The formation of the team members into tank crews and platoons would follow as the training program unfolded.

2-66 Armor.

The process to build the remainder of the two CAT companies was similar to the other battalions', but was complicated by some factors unique to 2-66 Armor. As in the other battalions, there was a detailed identification and interview process to sort out the very best crewmen that would be available in June 1987. The selection criteria were also basically the same. But there the similarities ended.

The requirement to form two CAT companies from one battalion was the major differentiating factor. This placed a severe limitation on the asset pool from which to draw qualified personnel. And it forced us to use other than pure volunteers when the volunteer quality cut dropped too low. But we believed that if we preserved as much unit cohesion as possible, we could overcome this limitation. Our analysis indicated the best approach was to find individual fillers for C Company and to build whole crews and platoons for D Company.

A related, but additional unique factor was that one of the remaining two tank companies (A Company) was a COHORT company. The soldiers had entered the Army together, completed basic training together, and trained and lived together for nearly three years. These personnel were, theoretically, centrally managed by Department of the Army in Washington and their reorganization was not permitted until February 1987. This would have been much too late to begin CAT training.

It was obvious that B Company and the Headquarters Company could not provide enough CAT quality soldiers to round out C and D companies. Therefore, we had no choice but to tap the resources of A Company in August 1986 and announce our justification by letter to Department of the Army.

By mid-August 1986, we had essentially moved one of A Company's platoons and one of B Company's platoons to D Company to form their 3rd and 2nd Platoons, respectively. Individual replacements from A, B, and Headquarters Companies filled out the remainder of both C and D Companies' personnel requirements.

By August 1986, the entire nature of the battalion had changed. After all personnel shifts were completed, the battalion had two newly organized tank companies of stable, highly skilled tankers. Morale was high. A and B Companies remained as newly organized companies of relatively "short-timers" and the lesser skilled tankers. Morale suffered. A Company would disestablish in February 1987 and be replaced by a completely new COHORT company from Fort Hood, Texas. CAT'87 would be foreign to them--but CAT '89 would loom on their horizon. B Company would repeat its 1985 role as a "non-CAT" company and would designate themselves as the "Stray Cats".

The Team Concept

"The whole company won it together, I think. Even though our platoon went down and actually won it, we couldn't have done it without them....Togetherness is what won it."[25]

SP4 David Segrest
Loader, D13, 4-8 Cavalry
CAT '87

The Canadian Army Trophy competition is won by a team -- not a loose collection of highly skilled individual tankers. And that team must be broadly based -- much broader than SP4 Segrest, above, can imagine. The boundaries of the team must be genuinely extended far beyond the company and battalion and into the support units and the community. This was done especially well in the case of the CAT '87 winner.

Team concept is used here to convey this thought -- **"every soldier was a necessary link in the chain of excellence."**[26] Some elements essential to making the team concept a reality are discussed earlier. Many are covered in subsequent chapters, especially the training chapter. Almost all elements are mentioned subtly. In this section I briefly consolidate the discussion so that the reader can recognize the elements of this key concept where ever he sees them.

All US divisions preparing companies to compete in CAT '87 recognized this team concept would be an important ingredient for victory. The three CAT company commanders discovered the concept was essential. The timing of their discoveries and the degree to which each division's policies supported the permeation of this team concept from the top of the organization to its roots, would define their company's winning opportunity.

4-8 Cavalry

"Our company was so tight...we were all brothers."[27]
PFC Steven Kuhn
Driver, D14, 4-8 Cavalry
CAT '87

The 3d Armored Division recognized from the beginning that a broadly based team concept would be an essential ingredient for victory. The command implemented policies to institutionalize the concept. The CAT attack plan (Chapter 3) was the first step. Support personnel, with few exceptions, were assigned to D Company and treated the same as the tank crewmen. All soldiers received distinctive nomex combat vehicle crewman uniforms and CAT patches at the same time and as early as possible. A "block leave" program applied to all team members. A stress management trip to Berchtesgaden for soldiers and family members further molded and rewarded the team during training. Leaders stressed a supportive, internally non-competitive environment to achieve professional excellence. Athletic competition served as useful tool to develop and maintain a competitive edge.[28]

Some often underestimate -- or forget -- the importance of the small, seemingly unimportant, unifying symbols.

"Everybody wanted to know where I got the uniform from....the tanker's uniform. Everybody was issued a tanker uniform with an American flag, a unit patch, and a CAT patch, also....It was important because at the time not everybody had the opportunity to get one and wear one....Everybody looked at you--the way you carried yourself and the way you worked as a team, whether you're a cook, a mechanic, or whatever. And whenever we'd go somewhere we'd always go as a team."[29]

SSG Drake
Mess Sergeant, 4-8 Cavalry
CAT '87

Likewise, it would be hard to convince PFC Berry, below, that the company athletic program did not contribute in a big way to the CAT '87 win.

"...our platoon was so close....We'd wrestle...
We were close physically. We were close mentally.
We were close emotionally, intellectually....
We also didn't take ourselves too seriously."

PFC Brent Berry
Driver, D12, 4-8 Cavalry
CAT '87

In summary, it would be difficult to document the precise recipe for 3 AD's team concept. But we do know they won -- and we do know that they tangibly resourced team building efforts throughout the entire training period.

3-64 Armor

The foundation of the team concept in the 3 ID seemed more narrow than in the 3 AD, primarily due to the early decision to form the CAT company from the assets of only one brigade, rather than the whole division. The impact may have been purely psychological, for I have found no documentation of lack of support for their CAT program. As in 4-8 Cavalry, many of the support troops were attached to the CAT company for the training period.

One technique the battalion commander used to broaden the team concept beyond the CAT company was the active participation of the company personnel in battalion activities. General Defense Plans work and support to battalion qualification gunnery training were major activities.[30]

Training focused on building interchangeable crew members within a tank crew and platoon. The forming of the crews into cohesive, confident platoons with "a will to win" was viewed as the key to victory.[31]

There is little emphasis on the team concept in the 3-64 CAT After Action Report, especially relative to 4-8 Cavalry and 2-66 Armor.

2-66 Armor

The 2nd Armored Division (Forward) encountered some difficulty in extending the boundaries of the team concept much beyond 2-66 Armor, its only tank battalion. The major exception was the CAT support element from the 498th Support Battalion. The rest of the division focused on its other missions for the most part -- and expected the 2-66 Armor to support those missions and prepare for CAT.

Within the 2-66 Armor, both of the CAT companies (C and D) worked in very close support of one another -- before and after the random selection of D Company as the final competitor. In many respects, this was the most positive aspect of CAT '87 for 2-66 Armor. The other company commanders, with only occasional exceptions, actively supported the CAT program with all assets at their disposal. As the battalion commander, I constantly tried to sell the concept that winning CAT was a battalion mission and it would require the best efforts of the entire battalion to win. Most bought that theme.

In the final analysis, D Company overcame some major obstacles (disciplinary problems, lack of dedicated support team, shortage of Range 301 training time, long distances to Grafenwoehr) to form a cohesive unit capable of competing with the best tankers in NATO. Many programs worked well for them (physical training, family support, training with Allies, etc.) that reinforced their team concept. I am convinced that without constant attention to strengthening this team concept by the battalion and company leadership, the performance of D Company would have been considerably less.

Manning: Conclusions

Having examined in great detail the procedures used by each of the American divisions to build their CAT '87 teams--and based on my own personal involvement in the process, the following are the factors regarding manning the units (in priority) that earned the winning margin for the 4-8 Cavalry:

WINNING FACTORS:
Manning

- **Chain of Command Commitment**
- **Four-platoon Company Organization**
- **Platoon Master Gunners**

0 Chain of Command (division, brigade, battalion, and company) total commitment to win . The 3 AD Commanding General was personally and actively involved in the planning strategy and made the personnel resources of the entire division available to support the CAT effort as determined by the battalion chain of command.

0 The decision to organize the CAT company as a four-platoon company and eliminate members based on performance. This proved to be a very effective incentive for those who really wanted to compete and it provided the company commander maximum flexibility in personnel assignments.

0 Placing a master gunner in each platoon. This facilitated the expert and detailed supervision of crew training and tank maintenance that otherwise could not be accomplished.

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[1] From transcripts of personal interviews conducted by Soldier's Radio and Television, February 1988.

[2] Interview with General Glen K. Otis, CINCUSAREUR, 21 January 1988.

[3] HQ AFCENT. Canadian Army Trophy (CAT) Competition 15-19 June 1987 Rules and Conditions, 2 June 1986, pp.47-48.

[4] Headquarters, 4th Battalion 8th Cavalry, 3rd Armored Division Memorandum, Subject: After Action Report, 1987 Canadian Army Trophy Competition, 28 August 1987, p. 3.
[5] Ibid., p. A-1-1.
[6] Ibid.
[7] Ibid.
[8] Ibid.
[9] Ibid.
[10] Headquarters, 3rd Battalion, 64th Armor, 3rd Infantry Division Memorandum, Subject CAT After Action Report, 24 August 1987, p. B-1.
[11] Ibid.
[12] Ibid, p.3.
[13] Ibid.
[14] Ibid.
[15] op.cit., 4-8 Cavalry, pp. A-1-1&2
[16] Ibid., p. A-1-2.
[17] op. cit., 3-64 Armor, p. B-1.
[18] From transcripts of personal interviews conducted by Soldier's Radio and Television, February 1988.
[19] op. cit., 4-8 Cavalry, pp. A-3-1.
[20] From transcripts of personal interviews conducted by Soldier's Radio and Television, February 1988.
[21] Ibid., p.A-2-1.
[22] Ibid.
[23] Ibid., p.3.
[24] op. cit., 3-64 Armor, p. B-1
[25] From transcripts of personal interviews conducted by Soldier's Radio and Television, February 1988.
[26] op.cit., 4-8 Cavalry, pp. E-7-1.
[27] From transcripts of personal interviews conducted by Soldier's Radio and Television, February 1988.

[28] op.cit., 4-8 Cavalry, pp. E-7-1.
[29] From transcripts of personal interviews conducted by Soldier's Radio and Television, February 1988.
[30] op. cit., 3-64 Armor, p. 2.
[31] ibid., p. E-3.

Chapter 5

Training a CAT Winner

The peacetime key to preparing units tc win on the battlefield is a well planned, combat-task oriented, properly resourced and supervised, well executed training program. The excellent units in the U.S. Army today operate under the premise that everything they do is part of their training program. Therefore, everything they do must be done according to a task - condition - standard and should contribute to the accomplishment of the unit's wartime mission. The training program must develop individual and collective (unit) skills that surpass expected standards -- and build the individual pride and unit cohesion necessary to overcome the stresses of combat.

"If you provide an environment in which you're not being attacked, abused or assaulted, but an environment where I can make mistakes, then those people--being so bright--will take that with them and want to train and want to learn."[1]

1LT Edward Masser
Platoon Leader, 1st Platoon
D Company, 4-8 Cavalry
CAT '87

In a similar but more specific manner, the tank companies that compete for the Canadian Army Trophy must, to a very large degree and for at least one year, redefine their principal mission. CAT preparation must dominate, if not monopolize the units' time. The tasks, conditions and standards related to winning CAT must be precisely defined. These tasks, conditions and standards will far exceed the normal target acquisition, fire distribution, tank gunnery

accuracy and tank maintenance standards expected of normal units. Then the companies must develop and execute a training program that focuses all available time and other training resources on perfecting those tasks under the prescribed conditions and standards. The companies will need a lot of help from their higher headquarters to perfect these tasks. The extent to which a chain of command can marshall training resources in support of their CAT company, permitting it to focus its efforts on the CAT tasks, will determine performance at the final competition.

All of the American battalions truly believed they could win the 1987 Canadian Army Trophy competition. Victory was the clear - cut objective. And based on the CAT '85 results, all knew that every main gun target must be hit in order to have a chance to win. Each battalion would develop its own training program based on its analysis of its training status, CAT experience and available training resources.

"You've got to train for the final objective. You've got to give the people room. Keep their families involved as much as you can, because that will help morale. Make sure they take it seriously. You've got to understand that this is not just duty—this is an extra duty. This is a God-given mission."[2]

SGT Shaun Banks
Driver, D11, 4-8 Cavalry
CAT '87

This section will describe the major features of the training programs of the three American tank battalions and their competing CAT companies in order to determine the significant similarities and differences. Since many portions of the programs were similar for all three battalions, I will use the 4-8 Cavalry's as the baseline and highlight differences in the 3-64 Armor and 2-66 Armor programs. With these differences, combined with the final CAT '87 scores, I will

draw some conclusions as to what training factors provided the winning margin for 4-8 Cavalry.

Target Acquisition and Fire Distribution

In combat, especially in units with potentially overwhelming firepower such as tank and mechanized infantry companies, fast target acquisition and the efficient distribution of your firepower to destroy the enemy is a vital function. In CAT, it is the key to victory. Therefore, CAT companies and their parent battalions spend nearly a year of training developing and perfecting their standard operating procedures (SOP) to hit all presented targets in the shortest possible time using the smallest number of bullets. The 4-8 Cavalry called theirs the "CAT Attack SOP".

The main features of any viable CAT SOP (and I submit, a combat SOP) are:[3]

-- Target acquisition and sensing.
-- Firepower distribution.
-- Command and Control (movement and reporting).

A fundamental principle in developing a winning SOP is to build it from the ground up -- allowing maximum input from the soldiers that must execute it. All of the units did this to a large degree, although using different techniques. 4-8 Cavalry and 3-64 Armor developed a very detailed and range specific (targets numbered according to Range 117 or 301 layout) SOP.

2-66 Armor developed a more generalized SOP (we called it a grid system) that it could quickly adapt to any range. This decision was driven by three major factors -- our belief that a generalized system could better adjust to the uncontrolable factors; the desire to increase combat proficiency as well as with AT; the limited time we would have on the competition ranges. The 2-66 Armor grid system was a significant difference among the three teams, as the other teams used a precise target numbering system that was Range 301 - specific. In retrospect, it is possible that a range-specific type SOP is required to win. I am not sure, given the other major resource differences among the units.

Let us examine some of the key features of the unit SOPs and their development.

4-8 Cavalry

The D Company commander made the formulation of the attack SOP a company project to be developed "from the ground up" in phases. In phase one, after some initial guidance, each of the four platoons would develop its own internal SOP based on trips to Campo Pondand Grafenwoehr. In phase two, after their Grafenwoehr training period in the November - December period, the platoons were required to combine their best efforts into a single company SOP. This SOP was finalized prior to the company's Christmas leave period. [4]

"If you let the soldiers make the plan, they are more willing to really go with it, to give 110 % effort. If it's directed on them, they're going to do the very minimum."[5]

1LT Edward Masser
Platoon Leader, 1st Platoon
D Company, 4-8 Cavalry
CAT '87

After that, all platoons in the company were required to conduct all training according to the company SOP. Refinements were made through May 1987, based on lessons learned from UCOFT, SIMNET and live fire battleruns.[6]

3-64 Armor

The battalion took much the same approach as did 4-8 Cavalry, except that the basic fire distribution SOP was built in June 1986 -- much earlier than the 4-8 Cavalry and somewhat earlier than 2-66 Armor.

An imaginative technique was used by 3-64 Armor to build their fire distribution plan. Each crew was required to make range sketches--what they could and could not engage--while mounted in their tanks in their assigned competition lanes. This technique, in

combination with memorizing target pit locations and the distance and angle to targets, resulted in an extremely detailed knowledge of the competition range.

During training, the following key points were stressed:[7]

0 Even though the basic fire distribution plan will be modified as the training program evolves, always conduct practices according to the latest version of the SOP.

0 Force the tank commander to observe different sectors than the gunner. Develop special drills to support this.

0 Use target numbers and force all tank commanders and gunners to know the target numbers.

0 There is no substitute for a detailed knowledge of the competition range. Live fire on it as much possible. Dry run on it when ever it is available.

0 Precision sight reticle lay is an essential skill to achieve CAT accuracy standards. The combination of speed and accuracy must be stressed. Their analysis indicated best results were achieved by making the final reticle lay an upward movement. Against moving targets, the aiming dot must be placed on the target in the direction the target is moving for best accuracy.

0 Target acquisition and sensing skills are fundamental to making the plan work. Crews constantly trained to improve their acquisition ability to quickly acquire and engage the targets -- and then determine a hit or miss, in order to quickly re-engage if missed.

2-66 Armor

There was a major difference between the fire distribution plans of 4-8 Cavalry and 3-64 Armor, versus that of the 2-66 Armor. Whereas the former units developed a very range - specific target numbering system, 2-66 Armor developed a more general grid system. The 2-66 decision was based on several factors. First, we knew we would be severely limited in the amount of time that we could train on either of the Grafenwoehr ranges, making target memorization very difficult. The addition of new targets on Range 301 after it was placed off limits, reinforced this choice. Second,

we believed the grid system would better accommodate the unknown factors -- those things that are bound to go wrong and cause panic when they do. Third, we believed that a grid system was more akin to methods that should be used in combat -- and we believed we could win CAT with it.

It is very difficult for me to determine if the difference in fire distribution plans made a significant difference in the team standings. Others believe you cannot win without a range - specific plan.

The 2-66 Armor SOP was also built from the ground up. The procedure began with a review of the procedures used by C Company in CAT '85 at Bergen Hohne. Since the battalion was initially training two companies, each company (really each platoon) was permitted to develop the beginnings of their SOP and put it into practice during the August 1986 training period at Bergen (main gun rounds did not count against the allowed 134).

After the August live fire training period, and based on live fire experience, the leadership of the battalion and the two CAT companies (NCO and officer) constructed the basis for the grid system SOP. Then each platoon adapted its lessons learned to that basic plan. This "fire - and -adjust" process continued, with each company building a company SOP by the end of the January Bergen live fire training period. While there was much cross - feed between the companies, there remained some differences in their SOPs going into the March gunnery training period.

With the random selection of D Company to compete in CAT, the final SOP selection was determined. In hindsight, I believe we would have been further ahead had I forced the two company commanders to agree upon a standard SOP prior to January 1987.

Home Station Training

Home station training is a term applied to the training that is done using the local resources at or near a unit's home base, as opposed to the training that can only be accomplished at the major tank gunnery ranges and maneuver areas such as Grafenwoehr, Bergen Hohne and Hohenfels. There is often a wide variety in the resources

available at different stations. However, the best units in the Army habitually use the most imagination and conduct excellent training on these "limited" resources.

4-8 Cavalry

Based on their analysis of the after action reports of previous CAT units, 4-8 Cavalry concluded that: the lack of a stable and coherent training program hindered results; and previous units had concentrated their training almost entirely on periods at the major training areas, while effectively ignoring the home station training opportunities.[8]

Based on this observation, 3 AD and 4-8 Cavalry took the following steps:

0 In an effort to stabilize the training by eliminating distractors, they excused CAT team members from all guard duty and other work details. This was further supported by their brigade and division decisions to reduce the entire battalion's taskings accordingly.

The decision to excuse the team members was common to all teams after 1 April 1987. But the decision to reduce the entire battalion's guard and detail commitment was unique and innovative. This decision would enhance the battalions' team concept as well as reduce the battalions' administrative burden. Such a decision was not an option in the 2 AD (FWD), where there were only five battalions.

0 The division Engineers constructed a 1/4 th scale range in a local training area (Campo Pond) that simulated the two potential competition ranges. With this facility, the CAT team was able to conduct numerous practice CAT battle runs in their tanks (sometimes using sub-caliber ammunition).

No comparable facility was built by the other American units. 2-66 Armor attempted to coordinate the construction of a similar facility, but was unsuccessful.

0 Heavy emphasis was placed on tank commander - gunner training in the unit conduct of fire trainer (UCOFT). The UCOFT is a computer that generates specified target scenarios and measures the crew's performance as it engages these targets. The trainer facility

actually approximates the physical layout of the tank commander (TC) and gunner stations.

All American CAT teams made extensive use of the UCOFT. A more complete explanation of the UCOFT and its use by all of the American units is included later in this chapter.

0 The unit developed a standardized procedure for conducting after action reviews (AARs) that was used after every battle run, simulated or live. The objective of the review process was to sort out the real lessons learned from unstructured, emotional reactions to poor performance.[9]

Neither of the other two units placed as much emphasis on the formal structure of the AAR as the 3 AD did.

There are many other aspects of individual and company training conducted by 4-8 Cavalry that deserve mention here.

0 To solidify the team concept (discussed later), much of the company level training was based strongly on the input from the soldiers' assessment of their training deficiencies. Also, where possible, lower ranking members of a team would be assigned as instructors. This not only increased their expertise, it also encouraged more interaction between the lower and higher ranks.

0 The normal certification matrix for UCOFT training was used. The goal was to certify all TC-gunner combinations by 21 December 1987.

3-64 Armor

The foundation of the home station training program was the basic fire distribution plan. This plan was formulated based on a leaders reconnaissance of Ranges 117 and 301 in June 1986. Then local resources such as sand tables, scaled target ranges and mini-tank ranges were constructed to represent the potential competition ranges. From June 1986 forward, all battlerun exercises were conducted in accordance with this SOP. [10]

The 3-64 Armor home station gunnery program emphasized the following key features:[11]

0 Basic gunnery skills aimed at identifying the best mix of crews for the platoons.

0 Formulation of the basic fire distribution SOP and the boresight and zero procedures; constant practice of both.

0 Learning the CAT Rules and Conditions.

Other classes were taught on automotive and turret theory so that crewmen would truly understand how their equipment was supposed to work--and how to recognize when it is malfunctioning.

The unit constructed a fairly simple (but effective) scale model of Range 301 (they called it the Monroe Complex after their Master gunner).

2-66 Armor

At the outset, 2-66 Armor knew it would have limited scheduled time at major training areas -- especially relative to the 3 AD and 3 ID CAT units. Also, due to other mission requirements established by the brigade, combined with the fact that half of its tank companies were preparing for CAT, it was clear that the selected CAT company would be unable to train exclusively for CAT until after 1 April 1987 (only 2 1/2 months before the competition). The training strategy that was developed to cope with this situation had four main thrusts: the equipment must be finely tuned; the soldiers must be mentally and physically fit; there should be an early emphasis on crew gunnery; and, once trained, the expert crews would be melded into winning platoons.

To implement the strategy, the battalion developed a fully integrated training program to take maximum advantage of time and local resources --while maintaining the flexibility to add "scrounged" major training area time. The major elements of this program contained demanding tasks, conditions and standards that were to be met. These elements were:[12]

0 Personnel Training. This included physical and mental training, as well as medical, dental and eye examinations to determine potential health problems that would hinder training.

0 Maintenance Training. This included all checks and services and extensive maintenance instruction.

0 Gunnery Training. This included progressive training of individuals, crews and platoons using all available resources.

0 Supplemental Training. This included all the standard training events (common task training, skill qualification testing, ARTEP tasks, etc.) that maintain the soldiers, platoons and the company in a readiness posture to execute the wartime missions.

The cornerstone of our home station training program was a concentration on training for a 36 - target scenario (the maximum possible), beginning very early in our program. This concept overcame any complacency and sloppiness that might have existed in the CAT companies. It put tremendous pressure on everyone to perfect all procedures. Even when the "rumor" began to circulate in January '87 that there would be a maximum of only 32 targets, we still concentrated on engaging 36. There was at least one down side to this, at least at the live fire ranges. It cost us more main gun ammunition per battlerun, therefore, if we had shifted concentration to the 32 target scenario earlier, we could have done more live fire battleruns (assuming available ranges).

While we made good use of the available ranges in the Garlstedt local training area, our efforts were not in the same league with 3 AD and 4-8 Cavalry. Through a general lack of urgency by some, and the battalions' heavy concentration on UCOFT and SIMNET, 2 AD (FWD) and 2-66 Armor failed to construct a programed, first class mini-tank range. In hindsight, I believe this had a detrimental impact.

Other Key Local Training Resources and Techniques

At the insistence of all of the competing battalions, 7th Army Training Center funded and directed the manufacture of very detailed, scale model terrain boards of both ranges 117 and 301. These boards had lights designating known and estimated CAT target locations. A set of these terrain boards was provided to each CAT team. With these terrain boards, the CAT platoons could devise

methods to conduct battle runs in the class room -- as well as conduct precise AARs. The terrain boards were also invaluable tools to help develop and troubleshoot the platoon attack SOPs.

4-8 Cavalry developed a detailed program of **company classroom instruction** ranging from the CAT rules to the finest details of gunnery theory and technology. Each class was taught at least twice--once by an NCO and again by a junior enlisted soldier. The objective was that each crewman needed to know the others' jobs thoroughly. The end result was a standardization of all procedures (boresighting, zeroing, etc.) throughout the company. The CAT battalions followed much the same procedure and philosophy.[13]

Crew level and organizational **maintenance training** were done by the book -- every time. The same is true for the other units. This has been a hallmark of the CAT units for some time and is one of the major beneficial carry-overs after CAT.[14]

The Armor school at Fort Knox, Kentucky formed a mobile training team to teach a week-long **mini-Master Gunner's Course** to all CAT companies. The course was believed to be so valuable by the units that it was taught twice at each unit. All crewmen attended, not just the tank commanders and gunners. The following subjects were taught:[15]

- Theory and functions of the M1 fire control system.
- Troubleshooting the M1 fire control system.
- Random, variable, and bias errors in the fire control system.
- Main gun functions.
- Characteristics of the main gun practice ammunition (105 mm).
- Machine gun (both the M240 and M2) functioning and trouble shooting.
- Conduct of fire and degraded mode gunnery to include adjustment techniques.

0 Preparation to fire checks, boresight and zero procedures to include adjustment techniques.

0 Range determination.

In April, very late in the training cycle, all of the American units received a platoon set of **50 caliber in-bore devices**. With these devices installed in the main gun breeches of the tanks, the platoons could conduct numerous live-fire (sub-caliber) drills and battle runs without expending any of the valuable 134 main gun rounds. These devices were heavily used and based on the CAT teams' experiences, they may be purchased for the rest of the Army.

All of the CAT teams recognized the tremendous potential value of a **through-the-sight video device**. The Dutch CAT team used their sophisticated device extensively -- and nearly beat us. With such a television system, commanders and instructors can view the same sight picture as the tank gunner when he is engaging targets. Recordings of the action can also be made. Such a device can greatly assist in the discovery of deficiencies and speed their correction. Fort Knox and 7th ATC worked desperately to get reliable systems to the CAT teams but they were unsuccessful. Work is underway already for CAT '89.

CAT Battle Run
Tank Crew Proficiency Course

The construction of the CAT battle run tank crew proficiency course (TCPC) at Campo Pond was one of the most significant commitments made by the 3AD to win CAT.[16] It was certainly one of the most valuable training resources and it made a very large contribution to the winning margin of victory.

When preparing for normal tank crew gunnery qualification, a unit will conduct many dry-fire runs in their tanks of a simulated qualification course to perfect target acquisition, crew duties and fire commands. Generally, the closer the conditions of the dry-run course are to the actual qualification standards, the better will be the performance on the qualification course.

The same is true for CAT preparation -- but the construction of a CAT - like practice range requires substantial training area and equipment support. **3 AD recognized the requirement to conduct numerous dry-fire CAT battle runs in the actual tanks and between trips to major training areas.** Therefore, the division committed the resources to convert the training area at Campo Pond into a 1/4 scale model of the potential CAT competition ranges (first Range 117 and then Range 301). The terrain was contoured precisely and the suspected target areas were surveyed in. This scaled range was so accurate that the crews were able to transfer their knowledge of the terrain and potential target arrays to the competition range.

"By the time we went down range 301 we knew every inch of it." [17]

PFC Brent Berry
Driver, D12, 4-8 Cavalry
CAT '87

There are at least two other benefits from this scaled range. The first is improved target acquisition -- as the scaled targets are smaller and tougher to see than actual CAT targets. The second is that such a facility provides the ideal environment to develop and test the platoon attack SOP.

In order to gain the full benefit of the scaled range, 2d Brigade was given scheduling priority for the training area until June 1987. Even when other units occupied the facilities, they were not permitted to disturb the CAT range construction.[18]

Major Training Areas

As mentioned before, major training area is a generic term that applies to areas where units can deploy and conduct live fire training and large scale maneuvers. Since CAT '87 was to be held at Grafenwoehr on either Range 117 or 301, the control of these two ranges was a valuable lever.

Furthermore, the control and access to Range 9 at Bergen Hohne was key. It is the best equipped range in Northern Germany and is the most in demand all year.

There were three major factors influencing the scheduling of major training area time, especially Ranges 117 and 301 at Grafenwoehr and Range 9 at Bergen Hohne. First, there was the key date of 1 October 1986, after which all main gun rounds fired counted against the 134 round limit specified in the CAT 1987 Rules and Conditions. The main thrust here was to get some live fire range time (preferably on Ranges 117 and 301, or 9) scheduled after one organized for CAT, but before 1 October. Second, there was the key date of 1 January 1987, when Commander, AFCENT, would make the decision on the competition range (Range 301 was selected). Beginning 1 January, the selected CAT ' 87 competition range (Range 301) was off limits to all members of a potential CAT company until the week of the actual competition. Once again, there was a mad scramble to get live fire (or any other time) time on the potential competition ranges prior to 1 January. To the uneducated, this does not appear to be a problem until one is informed that these two ranges are the primary qualification training ranges for the U.S. Army Europe and some allied forces. There is hardly a day of unscheduled time (at least a year in advance) for these ranges. Third, the actual control of the ranges and the timing of that control is significant. U.S. divisions, like the 3 AD and 3 ID control large blocks of range time at Grafenwoehr. It is their habitual major training area and is located reasonably nearby (Gelnhausen, about 140 miles; Schweinefurt, about 80 miles). Normally, this range time is prorated about evenly to all the brigades (and subsequently, tank battalions) in the division. But for divisions with CAT teams, the range time is shuffled internally to give the CAT companies maximum possible time. On the other hand, the 2 AD (Fwd) and 2-66 Armor habitually train at Bergen Hohne (about 80 miles), with one trip per year to Grafenwoehr (about 400 miles).

Between the time they organized for CAT and mid-June 1987, both 4-8 Cavalry and 3-64 Armor trained (live fire and dry fire) for considerable periods of time on both Ranges 117 and 301. On the other hand, from May 1986 until the week prior to the competition, 2-66 Armor had four days of live firing time on Range 117(including the time required to shoot qualification gunnery for two + non - CAT companies) and three days of shared time for dry fire on Range 301. As partial compensation, the 2-66 Armor had approximately 10 live fire days on Bergen Range 9 -- much of it shared time.

Considering the above factors, each of the American CAT units were able to fire their tanks at major training areas as follows:

4-8 Cavalry

No matter how intensive the gunnery training is on simulators such as UCOFT and SIMNET, battles -- both real battles and CAT battles -- are won by putting holes in targets. The 4-8 Cavalry program at major training areas emphasized that point by very carefully determining whether or not each and every main gun round fired hit the target -- where it hit, or where it missed. Through their after action review (AAR) process, they could determine the cause for each miss and develop corrective action for each error. Over time (4-8 Cavalry spent 45 days on Range 117)[19], this process would develop skill and confidence in the men, equipment and procedures.[20]

-- Prior to 1 October 1986 --

During the period 20 September - 4 October 1986, the battalion's crews (and some from outside the battalion) participated in a 3 AD organized "shoot-off" at Grafenwoehr (Range 112), whereby all prospective CAT crews would be evaluated in live-fire tests according to CAT standards. During this period, each crew fired at least 50 main gun rounds, and this formed the basis for initial CAT crew selection and placement into the CAT company. All zeroing of the CAT tanks was done after the 1 October cut-off date.[21]

-- After 1 October 1986 --

During the 14 November - 5 December 1986 training density at Grafenwoehr, the 4-8 Cavalry stressed range familiarization on both potential competition ranges, 301 and 117 (18 possible days,

although 5 were lost to fog). This was the first time full-up platoon battleruns were conducted. These battlerun scenarios were based on "best guesses" for stressful target arrays rather than known firing data that would be developed later. This firing data would become invaluable for determining specific weaknesses and corrective action.[22]

During this 3 AD density, all of the Range 117 and Range 301 time allocated to the entire division was dedicated to the CAT teams. With this much time available, the CAT teams conducted numerous dry fire exercises and range walks. They studied actual and potential target locations, distances from various firing positions to these targets, and began to develop the best methods for the platoons to engage target arrays. Following these activities, two full days on Range 301 were used for a competitive shoot-off among the platoons. Recognizing the significant support role the family members would play on the long road to CAT, the division arranged transportation to Grafenwoehr for the tankers' family members to observe the platoon shoot-off. [23]

For its next major training area opportunity, the battalion deployed to Baumholder, FRG, for three weeks 30 January - 21 February 1987 (15 possible firing days, 6 lost to fog). During this time, it accomplished the following: [24]

0 Developed and verified a new zeroing system that it believed simplified the procedure, thus reducing errors and increasing speed.

0 The company further reduced its roster through performance screening, trimming the company to a standard three - platoon configuration.

0 After extensive firing exercises where actual target hits (confirmed by checking holes in targets after firing) were significantly different (as much as 42 one day) from target hit sensings (as determined by dedicated observers during shooting), the battalion was convinced of the need for a more precise scoring system. This realization was a turning point in their program.

0 The CAT platoons began to shoot at smaller targets (2/3 size) than the official CAT targets.

0 The fire distribution procedures were further refined due to the demands of the more narrow ranges at Baumholder. Narrow ranges make it more difficult for the crews to quickly define the responsibility for some targets, creating the potential for multiple engagement of a single target and wasted ammunition.

April 1987 (and Kitty CAT I). During April 1987, the CAT team conducted live fire gunnery on Range 117. Going into this period, the company had used less than half of its allocated 134 rounds per crew. The company began using its new scoring and tracking system. A computer was kept in the range tower to immediately record firing data. Thus a database of information was created that facilitated the quick identification of weaknesses and the adjustment of battlerun scenarios to correct problems.[25]

During their April training density at Grafenwoehr, the 3 AD organized a pre - CAT practice competition (they called it Kitty CAT I, 25-28 April) on Range 117. Only CENTAG teams were invited -- and those attending were D/4-8 Cavalry, Royal Canadian Dragoons 4th CMBG, 363 Panzer Battalion, and the non-selected 3ID company, D/1-64 Armor. The concept was to subject their team to the pressures of full competition prior to the actual CAT competition. Accordingly, the target presentations, battlerun procedures and crowd presence were created to closely duplicate the expected conditions on Range 301. The team even pre-selected the actual platoon firing order for CAT and implemented it for both Kitty CAT I and II. This had the advantage of teaching the platoons the subtleties of that position. This was a brilliant maneuver and the event was a great success.[26]

Some of the key points determined from the use of the computer-based scoring system were:[27]

1. Faster engagement times result in higher first round hit percentage (just the opposite of what one might think).

2. Range-to-target was not a strong factor in target misses.

3. Sensing the sabot round was a definite problem. Only 25% of the targets missed were reengaged.

4. Target acquisition and hand-off using a grid method was a problem relative to a target numbering system. More targets were

reengaged using the target numbering system. Based on this finding, the battalion developed and implemented a target numbering system that would work for both Ranges 301 and 117. It became the competition SOP.

5. Long range targets should be engaged first to avoid the problems of lasing and engaging through dust.

6. The SOP's, especially reporting requirements, were not strictly followed by some crews under the heat of competition (Kitty CAT).

7. Quarantine procedures were weak (did not develop confidence in and use of the reserve tanks).

These lessons would be used to develop the scenarios for the final live fire density.

May-June 1987 (and Kitty CAT II). D/ 4-8 Cavalry's final live fire gunnery period was 17 May-8 June 1987 -- the last three weeks before the CAT competition. Once again, even though much of this period was scheduled for qualification gunnery for the division, 3 AD gave the CAT team priority on Range 117. Knowing this, the team had programmed their bullet expenditure such that they had 30-35 rounds per crew going into the last week.

To take maximum advantage of the few remaining bullets, they developed special target arrays consisting of 20-24 targets. With these arrays, they could conduct more battleruns, using less ammunition per run.

Also during this period, Dr. Dennis Forbes, stress coach from the Department of Physical Education, United States Military Academy, West Point, New York, joined the team. He was to play a major role in the final preparation of the team. Essentially, he transformed the team from a participating team into a competing team.[28]

A more complete discussion of his role will be explained later in the section on stress management.

Because of the great success of Kitty CAT I, the 3 AD organized another pre-CAT competition (Kitty CAT II) 24-26 May on Range

117. This time invitations were issued to both CENTAG and NORTHAG team members. Those attending were D/4-8 Cavalry, Royal Canadian Dragoons 4th CMBG, the Royal Hussars. Neither of the other American teams attended. Once again, this competition was a great success and D/4-8 Cavalry claimed the winning honors.[29]

The subject of pre-CAT competitions is important. In early 1986 at a meeting of representatives of all potential American competitors, all units were in favor of an All-American pre-competition shoot. The objectives would be to expose the teams to the pressures of open competition and reward those American companies (three) that would ultimately not be selected. While all agreed in concept, the timing of the contest (relative to each unit's training program and bullet expenditure) and whose range assets would be used became major obstacles. They were not overcome. As a result, the Kitty CATs I&II, arranged by the 3 AD were the closest thing to realizing the originally conceived goals. In my opinion, D/4-8 Cavalry gained a major advantage from these contests.

June 1987 (Pre-competition week on Range 117). Each platoon was permitted time to conduct one final battlerun, as specified in the CAT Rules and Conditions.

-- Range 301 --

November-December 1986. The team got four days of firing time, including two days of competitive shooting against the other 3AD CAT team. Activities included an emphasis on section (half - platoon) gunnery and numerous range walks during range maintenance time. These walks featured some "reverse angle" views of the range to verify platoon SOPs. [30]

In summary, the following are the major lessons learned by 4-8 Cavalry from its extensive major training area periods: [31]

1. Practice battle runs must strictly duplicate actual competition tasks and conditions.

2. The strike (or miss) of all main gun rounds fired must be determined precisely.

3. Validate crewman skills before the official round count begins.

4. Tanks must be zeroed using a simple system.

5 Live fire pre-competition competition is a must.

6. SIMNET is not a gunnery trainer.

7. Schedule a major portion of your main gun rounds to be fired late in your live fire program.

3-64 Armor [32]

-- Prior to 1 October 1986 --

August-September 1986 (Grafenwoehr). Unlike the other CAT teams, the 3-64 Armor had the opportunity to conduct crew qualification gunnery (Range 117) for the CAT company prior to beginning the official round count. They used the opportunity wisely by using the gunnery scores as an additional evaluation factor to select CAT crew members. Additional range time and ammunition were available to run other crew and wingman exercises to help select CAT crew firing lane assignments.

The CAT company also had the range and ammunition resources available to conduct both live-fire and dry-fire battleruns on Ranges 117 and 301. In approximate numbers, the 3d Infantry Division provided the CAT team 3000 main gun rounds of ammunition during this period to improve its gunnery skills.

-- After 1 October 1986 --

December 1986 (Grafenwoehr). In addition to live-fire on both ranges 117 and 301, the company spent countless hours of range reconnaissance and dry-fire exercises. The fire distribution SOP was continuously revised and rehearsed. [33]

March 1987 (Grafenwoehr). The major emphasis was on live-fire battleruns against increasingly difficult target arrays. [34]

May 1987 (Grafenwoehr). Same activities as in March.

June 1987 (Pre-competition week on Range 117). Each platoon was permitted time to conduct one final battlerun, as specified in the CAT Rules and Conditions.

-- Range 301 --

September 1986. As mentioned earlier, the CAT team had the opportunity to conduct live-fire and dry-fire battleruns on Range 301. In combination with the firing done on Range 117, each crew fired approximately 200 main gun rounds in a three week period.

December 1986. Conducted more wet- and dry-fire exercises.

2-66 Armor[35]

-- Prior to 1 October 1986 --

August 1986 (Bergen Hohne). This was the first live-fire opportunity for both CAT companies after their formation. "Shake-out" CAT battleruns of 24-27 main gun targets were conducted with ammunition saved by the battalion during the FY 86 training year. Each platoon made numerous dry-fire battleruns to rehearse their SOP and then made one live-fire run (10 rounds).

-- After 1 October 1986 --

18-31 October 1986 (Bergen Hohne). The battalion returned from a major NATO field training exercise in late September and prepared 28 tanks for turn in -- a monumental task. Then we were issued 28 new tanks and we immediately married the CAT crews to their new weapons. They were now ready to deploy to Bergen to zero and battlerun their tanks to CAT standards. Crew, section, and platoon firing drills were conducted. Beginning with this training period, all platoon scenarios consisted of the maximum 36 targets. This was very stressful, but we had little time to "ramp-up". This early stress would pay off, but when combined with imprecise scoring, would mask some firing accuracy deficiencies.

January 1987 (Bergen Hohne). The entire battalion deployed to Bergen Hohne in late January to prepare for crew qualification gunnery and CAT. The weather is normally severe in Northern Germany at this time, so one cannot count on high range utilization time. To compensate for this potential shortage and to add an element of competition to our training, we packaged our Range 9 time with that controlled by the Dutch CAT battalion, 43rd Tank, and shared the range operation. Our battalion had developed an informal partnership with the 43rd Tank based on close cooperation in CAT '85. We knew they were good -- and would likely be a top contender in CAT '87.

March 1987 (Grafenwoehr). The battalion deployed to Grafenwoehr in early March to conduct crew qualification gunnery for two companies (one company was newly arrived from Fort Hood, Texas,

four days before deployment), conduct company team live fire exercises, and train two companies for CAT. This period would be followed immediately by an all night road march to Hohenfels and the battalions' annual ARTEP (primarily tactical maneuver training) evaluation.

The battalion was allocated a total of four days on Range 117 to conduct both crew qualification gunnery for two companies and CAT battleruns for two companies -- a very tall order. I split the time -- two days for each activity. And since these were our only programmed days on Range 117, we conducted 24 CAT battleruns in those two days, four per platoon. Our two CAT companies were well prepared and organized for this monumental task -- and they made significant progress. However, in hindsight, we did not get the maximum value from this time because we still had not developed an error - free spotting system to score the battleruns and the hectic firing pace left inadequate time for adjustments between runs.

But there was a bonus from the internal competition between the two companies. Both knew that for the non - selected company, this would be the last opportunity to display the skill they had worked so hard to develop. They both believed they were good enough to win CAT, if selected, and they wanted to prove it by outshooting the other company. As a result, those 24 battleruns in about 16 hours of firing time were a truly awesome display of precision tank gunnery firepower.

In the spirit of allied cooperation, the 2-66 Armor responded to an urgent request by the British 2nd Royal Tank Regiment for range time assistance. We coordinated facilities at Grafenwoehr for them; allowed them to observe our training techniques and range operations; permitted them to dry run behind our platoons' live fire battleruns; and permitted some live fire at the tail end of our last day of range time on Range 117.

At the end of the CAT training period, the two CAT companies returned to Garlstedt for maintenance and a short block leave period. The rest of the battalion deployed to Hohenfels. However, the officers from both CAT companies were required to join the battalion later at Hohenfels to provide an evaluation team to the brigade for ARTEP support.

April 1987 (Bergen Hohne). Originally, the battalion had no major training area time programmed for April. However, early in the year we actively encouraged the British and Dutch CAT units (who controlled the range most of April and May) that it would benefit all of us to organize some sort of joint competition in the April - May time period. They needed no encouragement and the British allocated some range time and established the procedures for a four-day NORTHAG informal competition. D/2-66 Armor, now officially selected, joined the selected CAT companies of the British, Dutch and Germans in the competition. While the battleruns were not standardized, but customized to team training requirements, and there were no posted results, the Dutch team established themselves as the best we had seen. D Company knew it would have to improve to beat the Dutch in CAT, just two months away.

Near the end of April, the 3 AD invited D/2-66 Armor and A/3-64 Armor to compete with them in their Kitty CAT II (24-26 May). Without question, we wanted to compete. We still believed an American team would win CAT '87 and we needed a head-on-head competition to determine exactly where we stood. However, to say that we had scheduling and resource problems was a gross understatement. But my staff and I worked feverishly with the brigade commander and his staff to develop the best alternatives, and if possible, participate in Kitty CAT II.

I proposed an alternative that would have us ship the D Company tanks to Grafenwoehr in time for Kitty CAT II, compete, and then secure the tanks (under 2-66 Armor control) at Grafenwoehr for the two weeks until the already scheduled final deployment to CAT '87. As there was no time or money to permit an unscheduled rail deployment to Grafenwoehr, this alternative solved that problem. For the already scheduled period on Range 9 in early June with the Dutch, I proposed that D Company shoot on C Company's tanks (also CAT - quality tanks that were already programmed for deployment to Bergen). In effect, this alternative would give D Company an extra opportunity to shoot under competitive conditions.

This alternative did have some disadvantages that troubled the brigade commander, who had substantial exposure to the subtleties of CAT:

0 The short notice deployment would be disruptive to an already full training program.

0 There was some risk involved with having the competition tanks out of the direct control of D Company.

0 D Company would be firing someone else's tanks late in the training cycle.

0 There was a slim chance of getting additional Range 9 time in late May (although this fell through before the final decision was made).

In the end, all of these concerns swayed the brigade commander, Colonel Baucum, to decline the 3 AD invitation.

June 1987 (Bergen Hohne Most of the battalion, including D Company deployed to Bergen in early June. D Company had one final opportunity to fine tune its procedures on Range 9 before deploying to Grafenwoehr for CAT. Once again, we combined our range time with that of the Dutch 43rd Tank and trained together. At the end of these two days, D Company believed it was ready to win CAT.

June 1987 (Pre-competition week on Range 117). Each platoon was permitted time to conduct one final battlerun, as specified in the CAT Rules and Conditions.

-- Range 301 --

The 2-66 Armor CAT teams had no programmed time on Range 301 between the time they organized and 1 January 1987. The last time any of the battalion had fired 301 was April 1986 under non-CAT conditions. We tried to break some time loose that would accommodated our other mission requirements. We sent special teams to photograph and walk the range. Through early December 1986, we were unsuccessful in obtaining the much needed live fire time. Then we had an offer from 3 ID to take any unused time on Ranges 117 and 301 from their density between Christmas and New Year's Day. There were no guarantees of live fire time (this is the worst time of the year, weather-wise), but there was a possibility if the weather permitted 3 ID CAT teams to complete their program. There would likely be plenty of dry fire time.

A decision to position ourselves for the possibility to live fire would have required the deployment of almost half the battalion to

Grafenwoehr on short notice over the Christmas and New Year's holiday. After much staff work and soul searching, I chose another alternative. I decided to deploy C and D Companies with a platoon of tanks and a small support package each on 27 December. This would permit us up to four days (weather and 3 ID permitting) to conduct dry runs on both potential competition ranges in our tanks. As it turned out, the decision was made on 29 December that Range 301 would be the CAT '87 range. Therefore, we were able to spend the majority of three days in our tanks on this range proofing our SOPs and learning the range layout.

The major function that occurs at the major training areas for CAT companies is firing the main gun rounds under the stressful conditions of a CAT-like battle run. To be successful in the live fire training program a team must be able to determine with a high degree of confidence the exact strike location of every main gun round fired. With this accuracy data, weaknesses can be positively identified for corrective action. Otherwise, one is guessing on a large number of the shots. This would be simple if one could inspect the targets after battle run. But to do so requires shutting down live firing on most of the rest of the training area as you go down range to inspect. This cannot be done in most cases, especially at Bergen. 3 AD did the best job of solving this problem. The other two units never did solve the problem satisfactorily.

Training Simulators

All of the American CAT teams relied heavily on the use of training simulators to prepare for CAT '87. I discuss the two primary ones here, the Unit Conduct of Fire Trainer (UCOFT)-- a tank crew (commander and gunner) trainer, and Simulation Networking (SIMNET) -- used as a platoon operations trainer in CAT training. To varying degrees, all units attributed much of their success to their training time on these simulators.

"I'd say being ready for it: having done it so many times, simulated it so many times, and simulated what could go wrong and what could go right. We got a really easy scenario and we'd been practicing on such

incredibly hard scenarios. It was hard to lose. It would have been incredibly hard for us to lose."[36]

PFC Brent Berry
Driver, D12, 4-8 Cavalry
CAT '87

Training simulators have been developed by the U.S. Army to meet at least two important needs. The first, and the one often getting the most priority, is the need to meet and sustain established training readiness levels at reduced costs--shoot fewer bullets, drive fewer miles, spend fewer hours, etc. The second, and the one gaining prominence, is the need to train on combat tasks to specified standards under combat-like conditions-- and have performance measured (and recorded for analysis) so that corrective action by leaders can drive improvements.

"...a great deal....and I think the best part of it was the after action [review]. *You could watch where every round went, who fired it, how long it took them to react....After about two weeks of it, we did one* [battle run] *and it was perfect. We didn't have any wasted rounds. I looked over to Sergeant Knox and I said, we're going to win this."* [37]

PFC Brent Berry
Driver, D12, 4-8 Cavalry
CAT '87

CAT units' achievements have added credibility to the training simulator concept, and these units are on the leading edge of pushing simulator technology to meet the Army's training needs. The strong performance of the American teams in CAT'85 and the victory in CAT '87 are strong indicators that the Army is earning large returns on its investment.

Unit Conduct of Fire Trainer (UCOFT)

The UCOFT is a gunnery training simulator that very closely approximates the physical layout of the tank commander (TC) and gunner stations of the M1 Abrams tank (there is also a version for the M2/3 Bradley). A trained instructor (experienced tanker) evaluates the two-man crew as the UCOFT computer generates pre-programmed animated target scenarios under various conditions of visibility and difficulty (including emergency action and degraded mode). Others, primarily the crew's platoon leader and platoon sergeant, can also evaluate the performance through a separate screen that duplicates the crewmen's views of the target area. As the crew engages the targets, the computer records their performance in such areas as target acquisition speed and accuracy, reticle lay (precision gunnery aiming skill) and fire commands (target management). These target scenarios were designed by the contractor (General Electric) in coordination with the Army. They are organized in a matrix that leads the crews through drills of ever-increasing difficulty as they attempt to certify on the UCOFT.

As mentioned earlier, the UCOFT had not been fielded in time for CAT '85 , so the CAT units trained on early production models at General Electric 's facilities in Florida. In addition to the standard target array matrix, the teams used a specially developed Range 9-specific program disk to generate CAT target arrays. This training was very successful and there was a positive correlation between the amount of UCOFT training and the final unit standings in the 1985 CAT competition.[38]

Since fielding, the UCOFT has become the cornerstone of the U.S. Army tank units' home station gunnery program. Every tank and mechanized battalion in Europe has at least shared-use access to one. Most have their own and it is their premier home station gunnery training device. Consequently, the UCOFT has been the subject of much study and analysis. The major findings are:[39]

- Crews are able to detect, engage, and hit targets 20 percent faster.

- The negative impact of personnel turbulence on crew gunnery performance is reduced.

0 Degraded mode gunnery training is facilitated where it would otherwise be dangerous or impractical.

For CAT '87, as for CAT '85, a special CAT program disk was developed (by General Electric and 7th ATC) for the UCOFT. It simulated the terrain of the competition range and presented target arrays that were estimated to be similar to those that might be faced during the actual competition. Given the proven success of the UCOFT in CAT '85 preparation and in other tank units, UCOFT training was the mainstay of the home station training program.[40] It was heavily used by all American CAT units. They even borrowed time on 7th ATC's UCOFT while deployed to Grafenwoehr.

4-8 Cavalry

As mentioned earlier, training on the battalion's Unit Conduct of Fire Trainer (UCOFT) was the cornerstone of the 4-8 Cavalry's home station training program. It was used heavily, beginning with initial screening tests for tank commander/gunner combinations and extending through Range 301 battlerun scenarios using a specially developed CAT disk. Key features of the UCOFT training program were as follows:[41]

0 Initial TC/gunner screening using selected standard UCOFT exercises.

0 Certification (in accordance with the standard training matrix, except protective masks) of all TC/gunner combinations NLT 21 December 1986. This was especially significant because certification demands mastery of degraded mode gunnery skills--and ideal gunnery conditions are almost always degraded in CAT by the weather. In order to certify all crews on schedule, they found it almost essential to establish intermediate time and performance objectives.

0 Training specified reticle aim standards--maximum of .25 error in deflection or elevation.

0 Standard crew fire commands (as specified in the gunnery manuals) were not permitted, as they are too time consuming and congest the communications nets.

0 The CAT '85 disk was used until the Range 301 specific, CAT '87 disk was delivered in March 1987. Drills consisted of battlerun exercises (unique for each lane), remedial exercises tailored to individual crew weaknesses, and wingman exercises.

In the opinion of 4-8 Cavalry, the Range 301 CAT disk (prepared by General Electric and 7th ATC) was the single most important training device provided to the team. Additionally, they stressed that since degraded mode gunnery is so important to CAT preparation, all crews must be required to certify on the standard matrix before moving to the CAT disk.[42]

3-64 Armor

The key features of the 3-64 Armor UCOFT training program are as follows:[43]

0 CAT team tank commanders and gunners were required to certify on the UCOFT according to the contractor (General Electric) developed training matrix. This process was completed by November 1986.

0 Once the crews were certified on the GE matrix, they were required to train according to a unit-developed matrix using the CAT disk.

0 3-64 Armor believed UCOFT was key to developing speed and accuracy in gunners. For them, it was the best stress inducing gunnery training short of live-fire.

2-66 Armor

The battalion's approached the UCOFT training much the same as the other battalions. However, the requirement to train two CAT companies and prepare the rest of the battalion for qualification gunnery placed heavier demands on the battalion's single UCOFT. Some important features of the 2-66 Armor program were:

0 Certification of the CAT crews could not be accomplished prior to March 1987.

0 Intermediate performance objectives were established and reviewed thoroughly at platoon, company and battalion level.

0 Late in the training program, we discovered the need to immediately move from simulator training to some type of training requiring manipulation of the fire controls of actual tanks. Otherwise, subtle differences between the simulators and the tanks tended to induce negative training lessons.

Simulation Networking (SIMNET)

Simulation networking (SIMNET) is a concept whereby simulators of various types are electronically linked to form a local area network (LAN), much as office computers are linked to exchange data among themselves. Environmental factors (terrain, weather, target arrays, enemy forces, etc.) can also be plugged into the LAN. On a larger scale, these LANs can be electronically linked by various communications means, for example, satellite, to form a long haul network (LHN). With this connection, the LANs can interact, much as geographically separated divisions of major corporations exchange business data. In the case of military applications, the simulators might be tanks, aircraft, artillery pieces, command posts, etc. and their crews. Mixtures of simulators can be plugged into LANs to form units and task forces with their commanders and staffs. These units can be plugged into a LHN, along with designated environmental conditions, to fight with or against each other. Given this arrangement, computers are not fighting computers. Real people and units are fighting others--maintaining a crucial element of war.[44]

The SIMNET concept is a powerful one and takes advantage of burgeoning technologies. To get the concept from the laboratory to the battlefield, the SIMNET program was established by the Defense Advanced Research Projects Agency (DARPA) in partnership with the U.S. Army and Air Force.

I devote considerable, and perhaps excessive, coverage of SIMNET here for several reasons:

0 SIMNET played a major role in the perfection of the CAT '87 unit fire distribution SOPs. That role, combined with the U.S. victory, gave the SIMNET concept and program visibility it needed and may not have otherwise obtained.

0 The SIMNET concept has tremendous potential for future military training and development programs (briefly discussed in Chapter 7).

0 SIMNET's capabilities were diverted on very short notice to support the CAT '87 training effort. That story needs to be told. It is one of innovation, inspired by the heat of international competition, that rivals any found in popular books such as In Search of Excellence.

CAT '87 SIMNET

The CAT '87 competitors used a version of SIMNET that represented only a small fraction of the potential capabilities of the concept. However, those capabilities they used were substantial relative to previous training devices. It would just take a little time for the platoons to learn the system.

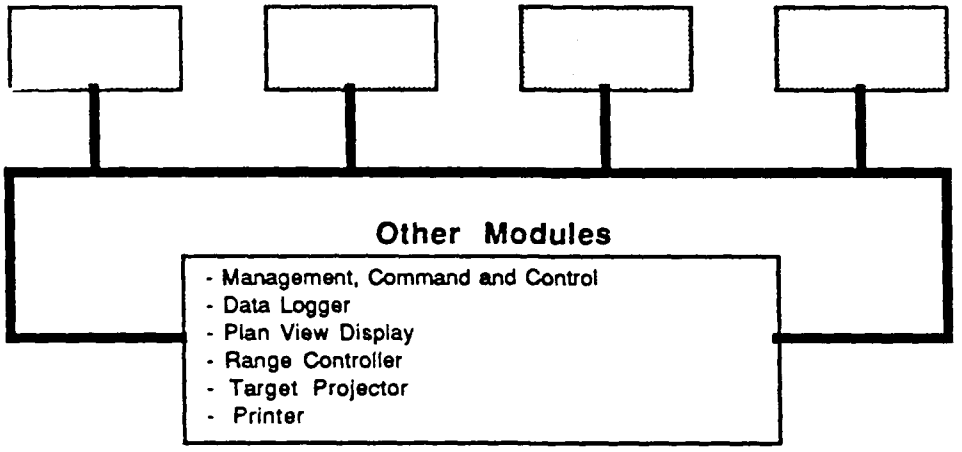
" The most important thing that helped us win that competition was SIMNET....That got us together. That had all 16 people in there in the simulators talking to one another, doing what you'd actually do on the range. That is what pulled it together." [45]

Corporal Jeffery Normand
Gunner, D11, 4-8 Cavalry
CAT '87

The CAT '87 SIMNET configuration consisted of four M1 simulators plugged into a local area network to form a tank platoon.[46]

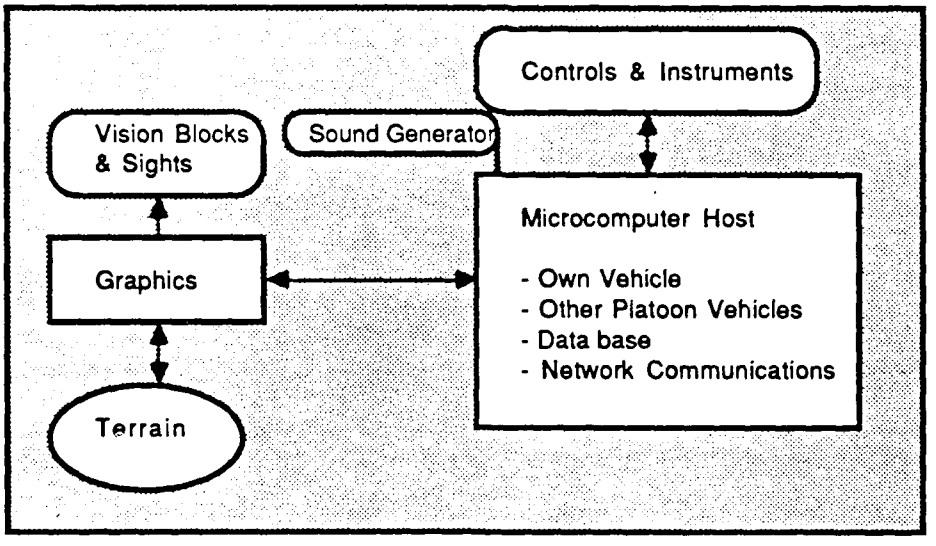
CAT '87 SIMNET

4 M1 Simulators



The M1 simulators provided functional (but not necessarily exact replicas) crew stations for all four crew members. A schematic of an M1 simulator is shown below: [47]

M1 Simulator (SIMNET)



The network provided the controllers (company leaders) the capability to precisely design target scenarios, view crew and platoon

battlerun performance in real time, play back the battleruns for after-action reviews, and record the battleruns for subsequent analysis. In fact, the system was initially believed to be a gunnery trainer -- which it was not. As stated earlier, SIMNET is a concept whereby simulators (in the case of the CAT competitors -- M1 tank simulators) are electronically linked together in a local area network (LAN). For the CAT competitors, the LAN represented their platoon.

"For driving, it was totally realistic." [48]

PFC Steven Kuhn
Driver, D14, 4-8 Cavalry
CAT '87

Link-up: CAT and SIMNET

From a previous exposure to the SIMNET concept in 1985, I was pretty sure that SIMNET was never intended to be applied to anything like CAT preparation. So as I observed the evolution of the SIMNET support to the American CAT teams, and then began research on this paper, my intuition told me there was an interesting story to be discovered an told.

My source was Colonel (USA, Retired) Gary W. Bloedorn, a consultant to the Defense Advanced Research Projects Agency (DARPA) and to Perceptronics Corporation , the prime contractor to DARPA for SIMNET. [49] Bloedorn had been the Battalion Commander of 2-81 Armor, the first U .S. Army CAT competitor, in 1977. He acknowledged that he and his unit had been embarrassed by their relatively poor performance -- and that embarrassment had stuck with him all these years. When the opportunity to vindicate that loss presented itself, he was ready to seize it.

Prior to his retirement from the Army, Bloedorn had been responsible for training at the U.S. Army Armor Center at Fort Knox. This was the in the early stages of training simulator development to support Armor requirements. Upon retirement, he worked very closely with the Armor Center to develop the task-by-task requirements for SIMNET.

Bloedorn had a good friend, Lieutenant Colonel Gary Eldridge, who worked in Department of the Army Headquarters (Training) and was actively involved in the development of SIMNET for the Army. When LTC Eldridge discovered he was soon to take command of 1-64 Armor, a potential CAT '87 competitor, he immediately recognized the SIMNET potential for training CAT units. Eldridge and Bloedorn began to figure a way to make it happen.

After discussing the feasibility of their idea for CAT support with Lt. Col. Jack Thorpe, USAF, the SIMNET Project Manager at DARPA, Bloedorn and Eldridge sought and received the full support of some key Army leaders. They sold the idea to General Otis, CINUSAREUR, MG Rick Brown (and later, MG Tom Tait, Brown's replacement), Commander of the Armor Center, and BG Phillip Mallory, Commander of 7th Army Training Center (7th ATC) at Grafenwoehr. Mallory had been an old friend of Bloedorn's and was key to providing facilities support at Grafenwoehr and gaining approval to use SIMNET from the German Chief Judge of CAT.

Once they got the go-ahead (December '87), the Army established the goal to complete the installation of SIMNET at Grafenwoehr in time to provide approximately 120 days of training time prior to CAT. That meant that from a dead start, the facilities at Grafenwoehr and the SIMNET database had to be established in about three months. Needless to say, there were many key people required to make this happen, in addition to some already mentioned.

One was Major Bill Bell, 7th ATC range operations officer and CAT project officer. It was no accident that Bell was assigned these duties. CAT-experience was his calling card. He had served as the company commander for 3-64 Armor's CAT team in 1985. Bell would ultimately contribute as much to the overall success of CAT '87 as anyone.

Relative to SIMNET, his role was vital. He was responsible for verifying all range measurement data for Range 301 and getting it accurately inserted into the SIMNET database. He then monitored the progress and validated the results each step of the way.

Another key SIMNET player was Dr. Duncan C. Miller, project manager for SIMNET software development at BBN Laboratories

Incorporated, a subcontractor to Perceptronics.[50] Dr. Miller owned many of the engineers and technicians that would put SIMNET in place and make it productive for the troops.

Dr. Miller received the telephone call from Bloedorn proposing the SIMNET support to CAT at Christmas time, 1986. He immediately saw this as an opportunity to breath new life into his project that had begun to stagnate. Miller described himself as a person always seeking new challenges, and he saw the SIMNET application to CAT as fundamentally new -- and a chance for his people "to do something real". He knew CAT would be a high visibility contest and a tool for innovation -- that is as he defined it, collecting bright people committed to excellence. The clearly defined objective of winning CAT '87 in June provided a recognizable objective to shake up his bureaucracy and get it moving. According to Miller, the final spark of inspiration for his people was the very obvious commitment and professional skill of the soldiers training for CAT.

Between that Christmas phone call and the initial training period for CAT in early April, much had to be accomplished. The SIMNET facility was assembled under the direction of Mr. Ulf Helgesson in the Perceptronics facility in California and shipped later to Grafenwoehr. It was assembled in a new modular fashion to permit simultaneous work. The software engineers had to learn the CAT rules and think like a tanker to modify the software -- and in some cases (scoring and target representation), built completely new software modules. The software engineers moved to Grafenwoehr to support the training. There the software underwent continuous revision and improvement as the engineering skill of the developers was combined in a "critical mass" with the tanking skills and drive to win of the CAT soldiers. The product was important to the June victory.

SIMNET Training Program

Once the SIMNET trainer was in place at Grafenwoehr and the training facility was ready for troop use, each CAT company was permited to select equal amounts of time that were most compatible with their training programs. Each selected two training periods of about one week duration each, and some additional time during the actual CAT competition.

Each team developed its own training program, since there was no significant experience to build upon. There was some cross-fertilization of experience among the teams as they progressed, but not much. The SIMNET staff and the Army Research Institute data recorder, Mr. Ron Kramer, were very helpful in passing along lessons learned. The details of the SIMNET training periods of each unit are captured in an excellent report written by Mr. Kramer (see bibliography). The following are highlights from the units' own accounts.

4-8 Cavalry

"I think anybody in the company could have fit into another platoon just like clockwork because our SOP was all the same. Everybody worked together and performed the same type of tasks. Even the maintenance people."[51]

SSG James Traxler
Tank Commander, D23, 4-8 Cavalry
CAT '87

D/4-8 Cavalry did a lot of smart things during their SIMNET training periods:[52]

0 They designated the Company Commander, Captain Schmalzel, and the company master gunner, SFC Smith, to serve as the instructor-operators for all of the platoon training. This would better facilitate the isolation of SIMNET equipment/software problems and platoon training weaknesses, especially failure to adhere to the company fire distribution SOP.

0 They recognized some significant differences between the SIMNET trainer and actual conditions (some tank-related, some environment-related) and they made excellent adjustments.

- SIMNET did not require the gunners to "dump lead" as the moved their sights from one target to another. This is a critical skill to acquire to shoot accurately with the M-1. Their adjustment was to emphasize this shortcoming to the gunners, limit the time spent

SIMNET, and quickly follow SIMNET training with UCOFT training (which required the dumping of lead).

- SIMNET had no thermal sight capability, a key part of the CAT SOP. Platoons had to compensate for this without forgeting this technique.

ô In addition to simply conducting CAT battleruns, the company commander also used SIMNET to design especially difficult situations to stress the SOP and the degraded operations procedures of the platoons.

0 Based on the known differences between SIMNET and the actual conditions, Dr. Forbes did not permit the 1st platoon to train on SIMNET just prior to their competition battle run, as the other platoons had done.[53]

3-64 Armor

A/3-64 Armor considered SIMNET to be a tremendous asset, especially since the competition range was off limits until the week of competition. Much of their training program was similar to the other CAT companies'. However, they found SIMNET to be most helpful to their program in the following areas:[54]

0 Platoon could switch crew members and improve crew interoperability.

0 The fire distribution SOP could be drilled numerous times.

0 They could design and wargame the various target scenarios.

2-66 Armor

D/2-66 Armor considered SIMNET its most effective SOP training device. With as little range time as the unit had, it is easy to see why. In my opinion, SIMNET was absolutely key to the

relatively good performance of D/2-66 Armor -- given the lack of total range time and especially the lack of live-fire time on Range 301.

D Company was the first CAT team to train on SIMNET and experienced many of the growing pains associated with that during their first training week. In addition, quite a bit of training time (especially leader time) was diverted to briefing visitors curious about this new trainer.

By the second training week, D Company had "broken the code" on some of the shortcomings of the SIMNET trainor and made adjustments. In addition to supplementing SIMNET time with substantial UCOFT training at Vilseck, we got some generous support from the 11th Cavalry during their tank crew qualification gunnery period. The Regimental Commander, Colonel Tom White, permitted D Company crews to train on 11th Cavalry tanks. This allowed our crews to manipulate actual fire controls and optics (dry-fire) against target arrays on Range 117 while the cavalry was shooting, thus overcoming some of the previously discussed SIMNET shortcomings. This was a significant breakthrough for D Company, and confirmed that SIMNET time must be immediately integrated with "hands-on a real tank" time to be most effective.

SIMNET Conclusion

SIMNET was an invaluable training resource for all of the American CAT teams. It was a major factor -- but not the only one -- that enabled all of the American companies to be within striking distance of the CAT '87 winner's circle. I believe this was especially true for D/2-66 Armor, since it had significantly less live-fire time at Grafenwoehr than the others. While I do not cite SIMNET as a factor providing the winning edge to 4-8 Cavalry (see training conclusions), this is because other training resources were so vast that they overshadowed the full impact of SIMNET. If CAT training for all units (U.S. and Allied) were severely resource constrained, SIMNET could clearly provide a winning margin.

Stress Control

For the young soldiers -- and most of the veteran tankers -- the pressure of the CAT competition would prove more stressful than anything they had faced in the Army. Not only would the competitors have to develop uncommon skills, but to win their performance would have to peak far above established standards. There would be many distractors to prevent the required peaking of performance -- spectators, waving national flags, equipment malfunctions, target malfunctions, poor weather conditions, self-doubts and numerous other "boogy men". The CAT teams would have to develop a program to overcome the effects of stress if they were serious about winning.

"I drove it past the crowd and didn't see them or nothing. Looking at the range, I was absorbed. It was really weird."

PFC Steven Kuhn 55
Driver, D14, 4-8 Cavalry
CAT '87

4-8 Cavalry

4-8 Cavalry solved the problem late in their preparation program by enlisting the help of Dr. Dennis Forbes, sports psychologist on the staff of the Department of Physical Education, United States Military Academy, West Point, New York. Dr. Forbes had over twenty years of experience in coaching athletic teams and teaching stress reduction. He knew the nature of competitions and men's reactions to them. But in addition to all that, he served as an ombudsman within the unit, seeming to smooth some of the emerging organizational tensions.[56]

I visited Dr. Forbes at West Point to discuss his role in the CAT preparation and to try to determine the impact he had on the victory. The following is an account of that meeting. [57]

Dr. Forbes arrived at Grafenwoehr to support the 4-8 Cavalry CAT team in May, about three weeks before the competition. He had

been invited by the Division Commander, MG Griffin, thru the Corps Commander, LTG Woodmansee. This was not Forbes' first exposure to CAT. He had previously worked with the 3 AD's 1981 CAT team, 1-32 Armor, that finished third -- and according to Forbes, "should have won".

When he arrived at Grafenwoehr, the CAT tankers of D/4-8 Cavalry were far off the winning CAT standard. The platoons were consistently hitting only 26 0f 32 main gun targets (most misses occured at bound one). This was bad enough, but Forbes' experience had taught him that teams typically suffer a 20 percent degradation from peak practice performance when they enter actual competition. Without major improvement, the team was setting itself up for defeat and embarassment.

Forbes initially watched and did not interfere with the training. He immediately interviewed all the participants and discovered they were not concentrating at bound one, but were being distracted by their external environment. He needed to teach them quickly:

- First focus inward (monitor one's self physiologically to relax);
- Next focus on the equipment (inspect proper functioning);
- Then focus on the specific tasks (including mental rehearsal).

"Dr. Forbes made a real big contribution--the way he came in and settled us down when we first started and he first came out to watch us. Everybody was hollering. We couldn't wait for people to see us come rolling up in tanks-- screaming and yelling at the crowd, and stuff....he got us focused, He got us concentrating on our objectives, realizing what we were out there to do. That's when we really started noticing a difference in ourselves."

SSG James Traxler[58]
Tank Commander, D23, 4-8 Cavalry
CAT '87

In addition to calming the crews and improving their concentration, Forbes needed to convince them they could win. To do this, Forbes felt he needed to make adjustments to the training program. The platoons had been training to a standard less than the 32 of 32 targets required to win. Forbes immediately began practice battleruns against tougher than CAT standards -- smaller targets and more of them, and allowing in less time to shoot them. He established the obsession, "target and time", and he stressed that the platoon must attack the targets, not merely negotiate the course.

Within one week, the platoons improved to 30 of 32 targets. There were then 2 1/2 weeks until the competition!

"When I first started out you think how everybody in the world is watching you. Then we got Dr. Forbes from West Point and he taught us to concentrate on your job .....It's not you weren't thinking, but you just weren't aware of anything else around you."

PFC Steven Kuhn[59]
Driver, D14, 4-8 Cavalry
CAT '87

Forbes began to force rehearsal of emergency actions, eg. , equipment malfunctions, and personnel substitutions. He would designate tanks broken, pull tank commanders at the last moment, install long pauses at bound one to shake the crews -- in short, he created havoc for the firing platoons. All of this would pay off in June.

"...we were prepared for anything to go wrong. It happened to us all the time. We'd just say get out of the way quick, do it, fix it, ...it helps if you have way in the back of your mind that something might happen. Then you handle it better than saying nothing's going to happen."

PFC Steven Kuhn [60]
Driver, D14, 4-8 Cavalry
CAT '87

"Barring nuclear destruction, we'd been through so much already, so many things going wrong. There wasn't anything we didn't feel we could deal with because it had already happened once and we had to deal with it. We were doing it a lot for ourselves."

PFC Brent Berry [61]
Driver, D12, 4-8 Cavalry
CAT '87

All of the platoons were consistently hitting 32 of 32 targets by the completion of Kitty CAT II, about one week before the competition.

Dr. Forbes also instituted an isolation period for the platoons whereby they would be quarantined and placed on a strict schedule the day before their competition battlerun. The purpose was to facilitate

concentration and relaxation. None of the other American teams had this feature in their final preparation programs.

3-64 Armor

While 3-64 Armor executed an intense training program featuring considerable live-fire exercises to build confidence, there is no indication of a formal stress control training emphasis.

2-66 Armor

The battalion and company leadership recognized from the beginning that stress mangement might play a key role in a CAT '87 victory. However, we were not as successful as 3 AD in soliciting support. The D/2-66 program featured:

-- Stress management training conducted by 1LT Witkowski, based on training he had received at West Point as a member of the pistol team.

-- Additional stress management and relaxation classes were taught by the staff of the Community Counselling Center at Garlstedt.

Training: Conclusions

The U.S. Army focused unprecedented training resources on winning the 1987 Canadian Army Trophy Competition. All of the U.S. CAT battalions planned and executed extensive training programs to prepare their competing companies for final victory in CAT '87. And all of the companies produced remarkable results within the constraints imposed by their parent command structures, mission requirements, and the unpredictable factors of the competition. Every American platoon had a chance to win when its tankers charged into their initial firing positions at Bound One -- and this time, their competitors knew it.

The best American team, D Company/ 4-8 Cavalry, won the competition. It was no fluke. Features of their training program accumulated the winning margin over time (but especially in the late stages) that yielded three consistently high-performing platoons, each with a high probability of achieving the highest score. The following is my summary of the features that produced the winning margin.

WINNING FACTORS:
Training

- **Division-level training & support plan.**
- **Live-fire on Range 301.**
- **Scaled competition range.**
- **Allocation of Division range time.**
- **Professional stress management training.**

0 Division-level training and support plan. The 3rd Armored Division was the only U.S. division to develop a comprehensive plan that focused all essential division training and support assests on winning CAT '87. This permitted the battalion and company leadership to devote maximum possible attention to the finest details of CAT training, rather than diffusing their energy on other important, but non-CAT, missions and incredible administrative detail.

0 Live-fire on Range 301. The CAT platoons from 3 AD and 3 ID conducted extensive live-fire training, some under competitive conditions, on Range 301 (the CAT competition range). Those from 2 AD (Fwd) did not. Since range familiarity (especially under "combat" conditions) is such a key ingredient for victory, this feature provided both a technical and a psychological edge for D/4-8 Cavalry and A/3-64 Armor platoons.

0 Scaled competition range. The 3 AD scaled range (to Range 301 specifications) at Campo Pond facilitated continuous training opportunities under actual competition conditions while mounted in their tanks for D/4-8 Cavalry platoons as they trained at home station. Neither of the other divisions invested the extensive resources to approach this capability.

0 Allocation of division range time. There are only two ranges, Range117 at Grafenwoehr and Range 9 at Bergen, that can adequately duplicate the target arrays of the CAT competition range. The capability of both 3 AD and 3 ID to allocate the preponderance of the entire division's time (enough for five tank battalions each) on ranges 117 and 301 to their CAT teams yielded a significant advantage. Both used this advantage well, as 4-8 Cavalry spent 45 days on Range 117 in addition to their Range 301 time. The added feature of the pre-CAT competitions (Kitty Kats I & II) on Rang. 117 against other CAT teams produced a major psychological boost.

0 Professional stress management training. 3 AD was the only division to use professional stress management training in support of their CAT team. While difficult for me to quantify a winning edge as a result of this, I believe the supporting evidence is strong. The rapid improvement of all the 4-8 Cavalry platoons after the arrival of Dr. Forbes is indisputable. The capability of 1st Platoon to block

out all distractions, overcome several mishaps, and beat a near-perfect German score was remarkable and probably could not have been duplicated by the platoons of 3-64 Armor or 2-66 Armor.

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[1] From transcripts of personal interviews conducted by Soldier's Radio and Television, February 1988.
[2] From transcripts of personal interviews conducted by Soldier's Radio and Television, February 1988.
[3] op. cit., 3-64 Armor, p. b-2.
[4] Ibid., p. C-3-1.
[5] From transcripts of personal interviews conducted by Soldier's Radio and Television, February 1988.
[6] Ibid.
[7] op. cit., 3-64 Armor, p. b-2.
[8] op. cit., 4-8 Cavalry, p. C-1.
[9] Ibid.
[10] op.cit., 3-64 Armor, p. B-2.
[11] Ibid., pp. F-1 thru F-6.
[12] op. cit., 2-66 Armor, LOI.
[13] Ibid., p. C-1-2.
[14] Ibid.
[15] Ibid., p. c-6-1.
[16] Ibid., p. c-2-1.
[17] From transcripts of personal interviews conducted by Soldier's Radio and Television, February 1988.
[18] Ibid.
[19] op. cit., 4-8 Cavalry, p. B-5-1.
[20] Ibid., p. D-1.
[21] Ibid., p. d-2-1
[22] Ibid., p. D-1-2.
[23] Ibid., p. D-3-1.
[24] Ibid., p. D-4-1 thru 2.
[25] Ibid., p. D-1-3.
[26] Ibid., p. D-8-1.
[27] Ibid.
[28] Ibid., p. D-9-1.
[29] Ibid.
[30] Ibid., p. E-6-1.
[31] Ibid., p. D-2.
[32] Op. cit., 3-64 Armor
[33] Ibid., p. F-3.
[34] Ibid.

[35] op. cit., 2-66 Armor

[36] From transcripts of personal interviews conducted by Soldier's Radio and Television, February 1988.

[37] From transcripts of personal interviews conducted by Soldier's Radio and Television, February 1988.

[38] Barbara A. Black and Millicent H. Abel, "Review of U.S. Armor Crew and Platoon Training in Preparation for the 1985 Canadian Army Trophy (CAT) Competition"(Draft) , U.S. Army Research Institute for the Behavioral and Social Sciences (Fort Knox Field Unit) Fort Knox, Kentucky, March 1987, p. vii.

[39] Ronald B. Walker. " Armor Training Systems for the 1990's", National Defense, November 1987, p. 76.

[40] Ibid.

[41] Ibid., pp. C-4-1 thru 2.

[42] Ibid., p. C-4-2.

[43] op. cit. 3-64 Armor, pp. E-2 - F-5.

[44] Lt. Col. Jack A. Thorpe,"The New Technology of Large Scale Simulator Networking: Implications for Mastering the Art of Warfighting", Defense Advanced Research Projects Agency, Arlington, Virginia. November 1987.

[45] From transcripts of personal interviews conducted by Soldier's Radio and Television, February 1988.

[46] op. cit. Kramer, p. 13.

[47] op.cit., Thorpe, p.4.

[48] From transcripts of personal interviews conducted by Soldier's Radio and Television, February 1988.

[49] Interview with Gary W. Bloedorn, Colonel, USA Retired, 24 November 1987.

[50] Interview with Dr. Duncan C. Miller, BBN Laboratories, 24 November 1987.

[51] From transcripts of personal interviews conducted by Soldier's Radio and Television, February 1988.

[52] op. cit. 4-8 Cavalry, pp. D-7-1 thru 7-3.

[53] Interview with Dr. Dennis Forbes, Department of Physical Education, USMA. 11 December 1987.

[54] op. cit. 3-64 Armor, p. F-5.

[55] From transcripts of personal interviews conducted by Soldier's Radio and Television, February 1988.

[56] op. cit. 4-8 Cavalry, p. E-2-1.

[57] Interview with Dr. Dennis Forbes, Department of Physical Education, USMA. 11 December 1987.

[58] From transcripts of personal interviews conducted by Soldier's Radio and Television, February 1988.

[59] From transcripts of personal interviews conducted by Soldier's Radio and Television, February 1988.

[60] From transcripts of personal interviews conducted by Soldier's Radio and Television, February 1988.

[61]From transcripts of personal interviews conducted by Soldier's Radio and Television, February 1988.

Chapter 6

Equipping & Supporting a CAT Winner

" We all knew the tanks were in top shape. If we had to get off one and go to another one, we were confident that tank would hit, its commo was good--everything was good."[1]

Corporal Jeffery Normand
Gunner, D11, 4-8 Cavalry
CAT '87

A team cannot win the Canadian Army Trophy unless its tanks and support equipment are reliable and kept in an exceptionally high state of readiness throughout the entire training program -- not just during the competition week. Attaining and sustaining such a state of readiness requires a substantial investment of equipment and personnel resources. The U.S. Army made such an investment.

The logistical support of all the U.S. CAT teams was a massive undertaking requiring commitment and coordination at all levels from Department of the Army to the CAT companies. The sheer magnitude of the effort, including the issue of new tanks to 3-64 Armor and 2-66 Armor and new gun tubes to 4-8 Cavalry, is an important story within the overall CAT story that deserves full coverage. However, I hit only the high points here.

"First of all, like I said, total support. You need that".[2]

PFC Steven Kuhn
Driver, D14, 4-8 Cavalry
CAT '87

The Support Personnel

While much of the discussion in this chapter focuses on the equipment, primarily the tanks, the organization and commitment of the support personnel (mechanics, cooks, drivers, medics, etc.) are an equally important factor. These soldiers are the equivalent of a championship football team's interior linemen. That is, they are in the "trenches" at Grafenwoehr, Bergen Hohne, Baumholder, and other training areas backing up the tankers as they train -- yet they get little glory. But just as the football team's quarterback and running backs cannot win a game without the blocking of their interior linemen, CAT tankers cannot hit CAT targets fast enough to win if malfunctioning equipment diverts their concentration from their shooting.

There are several key factors regarding the support personnel. First, just as with the tank crews, the chain of command must pick the best people they have in the required specialties to support CAT. The supporters will be subjected to most of the same stresses as the tankers and they must perform to unprecedented standards. Second, the support personnel must be solely dedicated to the CAT support mission as early as possible in the training program. This early assignment will breed more in-depth knowledge of the CAT tankers and tanks -- and will actually reduced the management requirements of the CAT company commander due to his tighter control of his assets. Finally, the support personnel must become full fledged members of the CAT team with equal status to the tank crews. This means the same uniforms, same privileges, same discipline standards -- the same everything.

The Equipment

All of the equipment supporting the CAT teams must be the best the Army has available. In addition to bringing the best possible performance characteristics to the competition, the equipment must build tank crew confidence to such a degree that virtually no concentration is diverted from hitting all targets in the shortest possible time with the least number of bullets.

I discuss the equipment and support personnel topics according to the specific CAT battalion. Once again, 4-8 Cavalry will be the baseline program from which significant differences will be noted.

4-8 Cavalry

-- Assignment of Support Personnel -- [3]

In order to fully support their philosophy that training and logistics were inseparable, mutually supporting concepts, 4-8 Cavalry reassigned all (with the exception of battalion critical shortages) CAT support personnel (24) from the HHC to D Company very early in their preparation program. The 45th Support Battalion , the division's direct support unit, also designated a dedicated CAT support team (68 people). All support personnel became full-fledged members of the CAT team. This close association of supporters and shooters is credited with the teams' capability to rapidly isolate training problems from equipment problems when performance standards were not met.

-- Medical, Dental, and Eye Examinations -- [4]

All prospective CAT team members were administered very basic medical, dental, and eye examinations prior to the 1 October critical date when the 134 main gun round count began. The battalion made two key recommendations based on their experience:

0 All examinations should be accompanied by an in-depth interview by medical experts to screen out those with chronic problems that would not be detected in a basic examination. Because crew stability is so important to winning CAT, early identification of those who are likely to miss training or drop off of the team entirely is critically important.

0 All crew members should receive a complete eye examination (in a specialized clinic). Those otherwise qualified crewman requiring glasses should be issued contact lenses at government expense (two of the gunner's in the winning platoon wore contact lenses).

-- Competition Tanks -- [5]

Early in the program the determination was made that the 3 AD CAT team would compete with their recently issued (less than two years) M1 Improved tanks (M1 IP 's), rather than being issued new tanks. However, given that decision, the division pressed for and received new gun tubes selected to meet their precise specifications.

A significant issue regarding the tanks for all the U.S. CAT teams was the vision filter in the gunner's primary sight (GPS) The original equipment filter (blue filter) was satisfactory for all expected combat requirements, but under certain visibility conditions, was not satisfactory for CAT standards (very small targets). This had become a serious issue in CAT '85 and did not get a satisfactory resolution. For CAT '87, the Army's leadership decided in early 1987 to accelerate development, production, and installation of an improved GPS filter (yellow filter) on all production tanks -- beginning immediately with all CAT competition tanks. This filter replacement was a massive effort and was completed in mid-April.

-- Repair Parts Priority -- [6]

The 3 AD Commanding General, MG Griffin, instituted policies ensuring that no CAT tank missed an hour of training for want of a repair part that was present in the division. No effort was spared to get critical parts that were outside the division. The DISCOM established a minimum safety level for critical M1 parts, and once breached, only requisitions for CAT tanks for that part were filled.

-- Tank Maintenance -- [7]

In addition to the organizational maintenance program, there are several aspects of the 4-8 Cavalry tank maintenance that deserve special mention. First, the company commander directed that every practice battlerun be followed by an after action review, (AAR) that included maintenance interrogation of the crews and a detailed maintenance debrief by the company executive officer (or maintenance sergeant). This feature was key to sorting out the

equipment problems from the training "head space" problems, so that real corrective action could be initiated immediately. Second, all the gun tubes were replaced in February by the organic maintenance assets of the division. Finally, based on after action reports from previous CAT's, all divisions requested and received a special tank "peak-up," (lasting six days) conducted by a General Dynamics, team of technicians. Primary focus was on the tank fire controls. The peak-up was combined with the installation of the yellow GPS filter in early April. 4-8 Cavalry gave mixed reviews to the conduct of this effort, but did concede that it probably bolstered their confidence in the division's technical skills.

-- Transportation Requirements -- [8]

The division Movement Control Center (MMC) carried the ball for all transportation requests. The transportation requirements for CAT are enormous and often an administrative nightmare. Transportation requirements cover the entire spectrum from numerous rail requests to move troops and tanks to training areas to requests for buses to carry family members to observe the competition. Since many of these requirements are relatively short term and therefore unprogrammed, they require intensive management to be met. 4-8 Cavalry was very pleased with the support of the division MMC.

-- Training Ammunition -- [9]

The accuracy requirements to win CAT are so stringent that the practice training ammunition, and the actual competition training ammunition must be from a single dedicated lot selected to very exacting performance standards. The Army's Test and Evaluation Command, (TECOM) made the ammunition selections (main gun and machine gun) after screening the U.S. inventory. The ammunition was shipped to Europe prior to October and the accuracy validated by the CAT companies. All U.S. CAT teams fired the same lot of ammunition.

3-64 Armor,

-- Assignment of Support Personnel -- [10]

A dedicated organizational support team was selected according to very high standards and assigned as an integral part of the CAT team. The DS support, while excellent, was limited early in the training program but shifted into full support in the latter months.

-- Medical, Dental, and Eye Examinations --

I could find no documentation that this area received any special attention.

-- Competition Tanks -- [11]

Since 3-64 had owned their tanks about three years, the Army decided to issue their potential CAT teams new M1 tanks. Accordingly, 3-64 Armor received 14 new tanks and turned in 14 old ones during July-August 1986 (with substantial assistance from 29th Area Support Group,). The new tanks would not only serve to reduce the maintenance burden on the CAT teams, but they were also a significant boost to troop morale. The issue of new tanks was a huge resource commitment and tangible evidence of the Army's intent to win CAT '87.

-- Repair Parts Priority -- [12]

Repair parts were never a serious problem for the CAT team. The new tanks were a major factor here. While I could find no specific policy statement documented, it is clear that the CAT tanks had top priority.

-- Tank Maintenance -- [13]

The tank organizational maintenance program was intense and by the book. Maintenance was recognized early as a key to gunnery success. The CAT tanks received the same peak-up by the General Dynamics team as did 4-8 Cavalry.

-- Transportation Requirements -- [14]

The division provided a 60 passenger bus and two vans to meet many of the company's smaller transportation requirements. Other support was adequately covered.

-- Training Ammunition --[15]

Same as for 4-8 Cavalry. The 3-64 Armor was extremely pleased with the accuracy of the selected ammunition.

2-66 Armor,

-- Assignment of Support Personnel --

Because 2-66 Armor was preparing both C Company and D Company for CAT until the random draw on 1 April, the battalion was unable to permanently augment the normal company support teams. However, quality screens were used to ensure our best support was assigned to CAT. Only after 1 April, were we able to assign a full up support package to D Company. Additionally, the 498th Support Battalion, identified a dedicated CAT support package, but was unable to totally devote its efforts to CAT until after 1 April due to other assigned missions.

-- Medical, Dental, and Eye Examinations --

Thorough medical, dental and eye examinations were administered to all tank crew members. A special effort was made to authorize contact lenses, at government expense for those gunners and tank commanders that required glasses. We were successful after a long struggle (including excellent justification analysis by our soldiers) and major support from Dr. Robert Messner,, CPT., Medical Service Corps, Ophthalmologist.

-- Competition Tanks --

The battalion received 28 new tanks to replace those that C and D Companies had owned for about two years. These had the same positive affects as discussed for 3-64 Armor.

-- Repair Parts Priority --

The battalion experienced no serious repair parts problems. The CAT tanks clearly had priority within the battalion. If we had not drawn new tanks and distributed the best of the rest to the other two companies, we could have had serious problems. A and B Companies would have paid the bills for the CAT company priorities.

-- Tank Maintenance --

All maintenance was performed to very strict standards. The General Dynamics peak-up and GPS filter swap were accomplished as with the other teams. This took place in late April for D Company -- after its last major live-fire period prior to departing for the actual competition.

-- Transportation Requirements --

Our long distance from Grafenwoehr, combined with our relatively short notice requirements (driven by attempts to get range time), virtually consumed the battalion staff and D Company leadership. The battalion was provided a dedicated sedan to help ease the transportation burden.

-- Training Ammunition --

Same discussion as for 4-8 Cavalry and 3-64 Armor.

Equipment & Support Conclusions

The U.S. Army committed massive equipment and support resources to win CAT '87. Every effort was made to apply those resources evenly to all of the American units -- and that effort was quite successful. I may be "splitting hairs" to isolate equipment and support factors that made a winning difference. However, since 4-8 Cavalry was not issued new tanks and incurred the associated additional maintenance burden, I cite two factors that may have been significant enough to overcome that burden and permit a victory.

WINNING FACTORS:
Equipment & Support

- **Organic Company Support Team**
- **Repair Parts Priority**

0 Dedicated Organic Company Support Team. The early assignment of a dedicated support team to the CAT company commander provides the unit significant advantages. Maintenance personnel become much more attuned to the competition tanks and the crews. The administrative burden for the company commander is actually reduced because he does not have to rely on ad hoc support arrangements that unnecessarily divert his attention from training matters. Both 3 AD and 3 ID committed the personnel and equipment resources to enable early assignment of support teams to their CAT teams. 2 AD (Fwd) was unable to do this until April 1987, two months before the competition.

0 Repair parts priority. During CAT training, CAT tanks (and any other equipment) must be the top maintenance priority in the respective divisions. This was especially true for 4-8 Cavalry, since they competed with older tanks. Otherwise, valuable training time will be lost due to down equipment, and often incorrect training adjustments will be made because of undiagnosed faulty equipment. All of the divisions took this approach. However, full divisions (3 AD and 3 ID) with more tanks and larger repair parts inventories have an advantage over separate brigades with only one tank battalion. 3 AD obviously did what it took to win.

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[1] From transcripts of personal interviews conducted by Soldier's Radio and Television, February 1988.

[2] From transcripts of personal interviews conducted by Soldier's Radio and Television, February 1988.

[3] op. cit., 4-8 Cavalry, pp. B-1 thru 2.

[4] op. cit., 4-8 Cavalry, pp. A-4-1 thru 2.

[5] op. cit., 4-8 Cavalry, p. B-2-4.

[6] Ibid.
[7] op. cit., 4-8 Cavalry, pp. B-3-1 thru 3.
[8] op. cit., 4-8 Cavalry, p. B-4.
[9] op. cit., 4-8 Cavalry, p. B-2-3.
[10] op. cit., 3-64 Armor, p. I-1.
[11] op. cit., 3-64 Armor, p. H-1.
[12] op. cit., 3-64 Armor, p. I-1.
[13] op. cit., 3-64 Armor, p. H-2.
[14] op. cit., 3-64 Armor, p. I-2.
[15] op. cit., 3-64 Armor, p. I-2.

Where Do We Go from Here?

Chapter 7

The Benefits of CAT

There is virtually no limit to the high-value benefits that can accrue to the U.S. Army and the NATO Alliance as a result of the Canadian Army Trophy competition. Our training and equipment development are gaining only a small portion of those benefits now because we have lacked the imagination and vision to capitalize on our huge investments in CAT. Perhaps the incentive was never there before because the U.S. Army was not winning, -- lending its lessons little credibility. All that should change now with the CAT '87 victory.

"It wasn't just a job. It wasn't just duty. We were actually doing something that counted."[1]

SGT Shaun Banks
Driver, D11, 4-8 Cavalry
CAT '87

The timing for this change could not have been better. At the same time that East-West nuclear arms negotiations are causing a reexamination of conventional forces in Europe, the capability of the Warsaw Pact armored forces has increased substantially, placing ever-increasing demands on the NATO forces to counter the threat. For example, the reactive armor protection being added to the Soviet tank fleet will demand a more precisely placed shot (maybe two in rapid succession) by our gunners to get a kill. At the same time, the on-board ammunition carried by our tanks has dropped steadily from 63 rounds (M60 series tanks) to 55 (M1 tank) to 40 (M1A1 version). Changes like these demand the continued development of both human skills and equipment capability.

Continued good showings in CAT can help respond to this demand. This chapter will concisely list the benefits the U.S. Army and the NATO Alliance are gaining now and propose areas where we can get a much higher return on our investment.

Currently, there is no formal system that captures the experience and skills of the CAT teams and spreads them throughout the rest of the Army. However, to a varying degree and through the efforts of the battalion commanders of the CAT teams, CAT skills and experience often benefit the parent battalions as whole. For example, the 3-64 Armor battalion commander used his CAT tankers to help train and prepare the rest of the battalion for qualification gunnery.[2] In the 2-66 Armor, the CAT lieutenants almost always move on to become executive officers in other companies. Over the years, there can be a cumulative effect from this type of feedback Not surprisingly, the tank gunnery qualification scores of the 1st Brigade, 3 ID (parent brigade of 2-64 Armor and 3-64 Armor) and the 2-66 Armor habitually are among the tops in Europe.

Also evidence indicates that the maintenance posture of habitual CAT battalions is better than average.[3] The increased knowledge and skill of the tank operators and mechanics appears to have a major impact in at least two areas -- potential breakdowns are prevented, and actual malfunctions are properly diagnosed quickly. Both translate to a more combat ready unit.

Although significant on a local scale, these examples have little impact on the rest of the Army, but in some areas the CAT experiences could make a significant impact if there were a mechanism to capture and spread them.

Advanced State-of-the-Art Training

The winning American platoon put 35 holes in the 32 main gun targets it faced and brought back its remaining five rounds for a 100 percent first round-hit performance! What we are now demonstrating in CAT is a level of systems (man and machine combined) performance that far exceeds national training standards. What this should tell us is that our normal standards are too low and they need to be raised. Why accept less?

Gunnery results illustrate this point. At the National Training Center, battalion task forces attempt to engage and destroy an array of targets presented in a manner to simulating an attacking Soviet mechanized regiment. The targets are engaged with all weapons available to the task force commander -- tanks, Bradleys, artillery, attack helicopters, mines, etc. This is the closest thing to combat gunnery the U.S. Army is facing today. In a typical live fire engagement at the NTC, a task force might kill only 54 percent of the targets presented. The tanks average 5.4 main gun rounds per kill! [4] Why are these results so low -- especially since units intensively prepare for their training periods at the NTC?

Some of the major reasons are: [5]

0 Crews do not know target range or location--especially when dust, smoke and other obscurants reduce their vision.

0 Crews are unable to sense their own rounds.

0 There is poor coordination and communication among crews within a platoon as well as platoons within a company. Crews are fighting their own individual battles. The command radio frequency is too busy to enter and pass information and orders.

0 There is heavy reliance on battlesight gunnery (a technique using default computer inputs--usually 1200 meters and sabot ammunition) at ranges over 1800 meters. This causes rounds to strike short of their targets.

0 Gunners fail to continue scanning the target area.

0 Gunners fail to use the thermal sight as their primary sight.

0 No viable, practiced sensing SOP is used.

In short, NTC gunnery results consistently show our units sadly lacking in the areas of precision tank gunnery and target acquisition/target coordination procedures. These are exactly the skills that are mastered by the successful CAT competitors!

The competitive pressures of CAT have forced innovation in the training arena, producing an evolution in practices which coincidentally address most of the deficiencies noted at the NTC.

There is little reason why these practices cannot be used throughout the Army:

0 The methods of target acquisition and fire distribution developed by the CAT competitors are built "from the ground (crew level) up" and continuously practiced and refined.

0 Thermal sights were used for every engagement by at least a portion of the platoon. The procedures enable the units to defeat far more targets in a shorter time than standard methods.

0 Section gunnery with wing tank sensing is a key to rapid reengagement.

0 The radio communications nets are rarely used -- and then only to transmit vital information and orders in concise, standard form.

0 The accuracy of the weapons, both main gun and machine gun, is achieved through a combination of highly skilled and trained crews, careful ammunition selection, precisely adjusted equipment and proper maintenance of that equipment. The crews basically know all there is to know about the functioning of their tank and its weapons. Their eyesight is carefully controlled and contact lenses prescribed where appropriate. The standard training ammunition is fired and its flight characteristics documented and precise inputs furnished to the tank ballistic computers. The tanks are zeroed rather than calibrated by standard methods. Fire control components are thoroughly tested and close tolerances demanded. Every aspect of tank maintenance is done according to the book--every time.

0 Zero procedure for the main gun (according to Mr. Doug Waters, AMCCOM): simple, same sight picture. Precision gunnery may be needed to defeat reactive armor and other specialized armor configurations. And extra rounds for zeroing may translate to more first round hits--probably saving ammunition.

0 Range to targets is determined precisely--either by using the tank laser range finder or refined range estimation techniques (including thorough reconnaissance and the use of target reference points).

0 Simulator use can pay off as the CAT units have demonstrated --especially to drill crew duties and platoon SOPs. The credibility that CAT has given to UCOFT and SIMNET should launch a new era in the use of these devices. CAT units also validated some concerns regarding the limitations of these devices as total substitutes for firing live rounds. One key point learned was the requirement to integrate "hands-on-real-tanks" time with the simulator time to have the best effects.

0 Other devices, including thru-sight video and in-bore devices, contributed to gunnery skills.

0 Maintenance training (diagnostics) is provided for operators, cutting down-time on equipment.

Materiel Acquisition Process

The DoD materiel acquisition process is almost universally criticized for taking too long to develop equipment that does not work very well. Much of the criticism is valid--but remedies are less than plentiful. With the right approach by the Army's top leadership, the CAT experience can provide some potential improvement.

The environment of competitive training provides the opportunity -- actually, almost a mandate -- for the materiel developers (both government and civilian contractors) and the "real users" (in this case, the most qualified tankers) to work very closely together to solve field soldier's problems and push the limits of performance.

One of the best examples of this process at work is the recent British CAT experience and their resultant action to improve their tank. The British experience in CAT '83, '85 and now '87 has been very painful, at best. The British press noted the poor performances in 1983 and 1985. Shortly after CAT '87, the following article appeared:

"Challenger Tank Loses NATO Fight

The Challenger battle tank, which cost 620 million pounds (~1 billion dollars) to develop, failed last week for the third consecutive time to defeat its main NATO rivals in a gunnery competition.

The Ministry of Defense admitted that it was disappointed the Challenger gunnery team came last in the Canadian Army Trophy competition.....

A ministry official said that the competition was only a test of gunnery capability and did not include vital aspects such as tactics and agility. 'The results of the competition should not be taken as a reflection of our armed warfare capability as a whole."

The Army sources said that the Americans and Germans had spent several months training a special gunnery team, whereas the British gunners were selected at random from a standard Challenger squadron on the Rhine."[6]

There are some inaccuracies in this article and a continuing failure to publicly attribute poor performance to factors other than equipment. Even so, that performance forced a critical examination of the Challenger's fire control system. Based on that examination, there will be changes to decrease target acquisition and engagement times. Once the British tank fleet is updated with these changes, its combat capability -- and thus deterrent value -- will be increased.

Let me cite another example -- this time American. In the preparation for CAT '85, CAT gunners reported having difficulty seeing targets in the daylight mode under certain visibility conditions. The problem was the shading effects of a filter in the gunner's primary sight. This was not a problem for regular tankers training to normal training standards. At least they did not recognize it as a problem. However, in the pursuit of perfect performance where every shot must hit and every second counts, this filter was a major problem. Consequently by the spring of 1987, a much improved filter had been designed, tested, and approved for production for the entire M1 tank fleet. These filters were installed in the CAT '87 tanks prior to the competition and will soon be in tanks owned by the rest of the Army.

The development and advanced fielding of SIMNET is another spin off of the cooperation of the CAT competitors and the materiel developers. Many changes suggested by the CAT teams were incorporated into the simulator software, enhancing the value of the training simulation. SIMNET, by virtue of the CAT victory, has received wide spread recognition as a training device concept of the future. This is one example of modification of existing equipment. But the real problem in the acquisition process is getting the best "real user" input on the front end of the process--where the concepts are formed and the design alternatives are first tested. Potentially huge gains could accrue if the CAT competitors were taken to the Tank Automotive Command or Fort Knox as expert consultants for future tank or tank training device systems.

In a responsive materiel acquisition system, we could capitalize on the lessons of the CAT teams regarding the necessity to integrate simulator time with real hands-on time. This lesson could drive us to include on-board computer capability in our future combat vehicles that would permit them to function as their own self-contained simulators. What a potential payoff!

Recruiting and Retention

Winners attract winners--and right now the U.S. Army views itself, and is viewed by others, as a first rate organization.

Currently, the Army, along with the rest of the military services, is able to recruit and retain soldiers at a very high level of quality. We are at this point as a result of very heavy investments in modernized equipment (like the M1 tank) and large pay and benefit raises in the early 1980s. But circumstances are certain to change as the civilian-military pay gap widens. When they do, we need to have some offsets in place.

Gunnery competitions like CAT, especially as long as we win, can serve as a powerful recruiting and retention tool for the Army in general and the armored force in particular. With the notoriety of the M1 and its turbine engine and sophisticated fire controls, the added ingredient of winning international competition lends some "macho appeal" to the armored corps. A professional advertising

campaign by the Army could turn this to an advantage, much like Top Gun did for the Navy. The benefits could be long lasting.

Human Skills Development

For a long time, the Army did not do a very good job of establishing performance requirements and equipment designs with "the man-in-the-loop." In other words, the Army was almost ignoring one of the most important components of a weapon system. The competitive "laboratory" of CAT provides a ripe opportunity to document human performance and interaction with the equipment, while the stress of competition forces innovation that can have major positive impacts. Research on a level similar to that for Olympic games preparation is likely to evolve.

Interoperability with the Allies

If the United States fights a war in Europe, we will fight as a member of the NATO alliance. In order to be an effective alliance each member must understand the organization, tactics and skill of the other members. The Canadian Army Trophy competition has developed into an excellent vehicle to foster understanding.

4-8 Cavalry developed a very close relationship with the Royal Canadian Dragoons. This began with an initial visit by the Canadians to view some home station training. It extended through their participation in Kitty CATs I and II, and into the week before the actual competition when the 4-8 Cavalry shared time on SIMNET. It is likely that the performance of both teams was enhanced by this cooperation.[7]

2-66 Armor trained extensively with the Dutch. We learned a great deal about their tank, their training devices, and their training techniques. I am sure they learned the same from us, as we shared range facilities and held several social events. The relationship between the 2-66 Armor and the 43rd Tank Battalion could easily serve as a model for future partnership development.

In addition to the Dutch, the 2-66 also trained a good deal with the German 324 Tank Battalion (our normal partnership unit), other German CAT units, and the British CAT unit. All benefited from these training events.

Conclusion

Given so many areas of potential pay-off, there must be a better way to disseminate the CAT experience other than the normal personnel reassignment process. Let me suggest that the Army Center for Lessons Learned at Fort Leavenworth, Kansas, would be the first place to start. The center is already in that general business--focusing on the National Training Center. It would be an excellent forum to combine the lessons and establish professional, broad based dialogue.

[1] From transcripts of personal interviews conducted by Soldier's Radio and Television, February 1988.

[2] op. cit., 3-64 Armor, p. 1.

[3] MG Charles M. Murray, "USAREUR Battalion Level Maintenance Programs", (unpublished memorandum, DA DCSLOG, 14 July 1987).

[4] LTC Douglas B. Campbell, "Combat Gunnery: Observations from the NTC", Armor, September-October 1987, pp. 34-36.

[5] Ibid.

[6] "Challenger Tank Loses NATO Fight", The Times, 22 June 1987, p. 2h.

[7] Op. Cit., 4-8 Cavalry, p. E-1-2.

Chapter 8

Future CATs: Challenges and Pay-offs

The combat capabilities of the U.S. Army armored forces can be substantially increased through the competitive pressures of the Canadian Army Trophy competition. By constantly raising the thresholds of difficulty of the CAT tasks and simultaneously forcing these tasks to mirror the conditions of actual combat, American innovation and competitive will to win will push the frontiers of human and equipment performance. The increased performance levels will spill over to our allies. To evolve the CAT competition into a more challenging contest, I am advocating revolutionary transformation to gain the payoffs that will better justify the current and future expenses.

It will be difficult to make such a transformation for at least two reasons. First, CAT will have to be approached as a research and development (R&D) program, much like an operational test--but using front line armored units. This idea does not set well with many field commanders, who feel that other people are paid to do R&D work. But this is an excellent way to get the "real users" -- including those reluctant commanders-- involved in key human, tactical and equipment development decisions. Second, the larger and wealthier armies, the U.S. and Germans, will tend to have a competitive advantage in a more challenging CAT structure. Therefore, there will be a great reluctance on the part of some nations--and outright opposition by others--to move toward this kind of competition.

This chapter will propose some areas where competition performance limits and conditions could be made more realistic and

difficult. It will be up to the NATO leadership to make the appropriate changes and incorporate the benefits to the U.S. and Allied military.

Night Firing

A substantial amount of the fighting in modern warfare, past, present, and future, occurs during the hours of darkness or other periods of reduced visibility. With the advent of long range, highly accurate anti-tank weapons, the survivability of armored forces is inversely proportional to their ease of acquisition--and darkness tends to make their acquisition more difficult, or at least more expensive. The U.S. Army has invested heavily in night vision capabilities for its soldiers and equipment to give it control of the darkened battlefield. And for years now, the U.S. Army has trained long and hard during darkness--both maneuver and live fire--to give us a winning edge in combat. For example, approximately one third of the live fire tasks in the U.S. Army tank crew qualification course, the platoon qualification battle run, and the company team exercise are night time requirements. The M1 tank has extraordinary night fighting capabilities at extended ranges. Our UCOFT and SIMNET training simulators include substantial reduced visibility exercises and training opportunities. Our allies have not made the same investments in equipment or night training time.

At present, none of the CAT tasks are fired during the hours of darkness--although some are frequently fired during reduced visibility as a result of poor weather. We need to change this for our own and our allies benefit because substantial combat will take place at night or during reduced visibility. And since the operation and support funds spent to support the CAT competition are earmarked by the allied governments to maximize the combat capability of their forces, the military commanders have an obligation to fully develop these night fighting capabilities.

The competitive pressures of CAT, fostering R&D work, will push the limits of technology and inspire innovation in equipment design, training devices, tactics, and gunnery techniques. American tankers long ago learned that the night (thermal) sights could be used to tremendous advantage in the day time--especially to acquire personnel targets. During CAT '87, some American units discovered the thermal sights could be use in conjunction with the day sights to

pick up difficult to acquire main gun targets. A major design change in the optics of the M1 was made between 1985 and 1987 at least partially because of the target acquisition difficulties faced and loudly criticized by the CAT '85 teams. These examples are only the beginning of what could be gained Army-wide from night time competitions.

More Realistic Terrain

Rarely does armored combat take place in open, smooth terrain with tanks rolling slowly down hard-packed roads. Terrain of that description seldom exists in a war zone, and where it does, the acquisition capabilities of modern armies and the lethality of modern weapons virtually assure defeat for those forces that use it. To survive, armored forces will use every fold of the terrain, every building and rock pile, every gully and every vegetated area to cover and conceal movement. This is the terrain where the fighting will take place.

The CAT competition, as well as most live fire tank gunnery training, is conducted in relatively open, smooth terrain and the tanks do not travel cross-country. There are very valid administrative justifications (safety, environmental damage, maintenance costs, spectator convenience, equality of difficulty, scoring, etc.) for this. But where possible, we need to use our collective imaginations to make the terrain conditions more realistically challenging. If we do not compete on realistic terrain, a lot of money can be spent developing target acquisition and fire distribution techniques (and other SOPs) that will be ineffective in combat.

Simulated Enemy Fires

While the pressure of international gunnery competition is great, it is nothing like the pressure of knowing your tank may be in the sights of a crack Soviet gunner. Reactions and SOPs for operating under competition pressure might be quite different from those in combat.

Actually, the criteria that determine the winner in CAT , hitting the most targets in the fastest time with fewer bullets, are good measurements of combat skills. However, the techniques to achieve the winning standards in CAT competition might not be adequate or even correct for a combat situation. For example, the standard CAT practice of the tank commander riding high in the commander's hatch to sense rounds fired would be a loser in combat. For that matter, even having the hatch open during contact with the enemy would be hazardous. What is needed to make CAT more realistic and a better training tool is a simulated enemy that can shoot back at the

competitors. This could be accomplished with something like the U.S. MILES (for Multiple Integrated Laser Engagement System) system that is frequently used to interject realism into force-on-force exercises. The competitors could be "shot" when exposed too long, maneuvering incorrectly or employing other poor practices. Penalty points could be assessed and subtracted from total scores.

While this change would certainly add administrative complications to the already difficult task of conducting CAT precisely and fairly, the pay-off in new and better fighting techniques make this idea worth pursuing. It would also tend to reward and test the investments some countries have made in faster, more agile, lower silhouette tanks -- those harder to hit and destroy.

Chemical Threat Environment

A review of the Soviet chemical capabilities and doctrine, combined with more frequent use of chemical warfare in the world's current "hot spots," indicates a high probability that NATO would have to fight many of its battles in a chemical threat environment. However, none of the CAT tasks are accomplished in a simulated anti-chemical mode. Perhaps they should be included for the benefits of better training and equipment that accompany CAT competition.

The U.S. has invested substantial monies to give its M1 and M1A1 tank crews chemical protection. We conduct some qualification tank gunnery tasks and portions of many maneuver exercises in the chemical protective mode (tank hatches closed, crew protective suits and masks on). Our UCOFT and SIMNET permit play of the chemical environment, but there is really no technical reason that a simulated chemical threat could not be interjected to add realism and cause more realistic SOPs to be developed.

Increase the Challenges-Increase the Payoffs

Every country wants its teams to win CAT and every tank manufacturer wants its tank to wear the tag "the worlds best tank." The peacetime competition payoffs are already large and growing. The United States and some of its NATO allies are making the huge

investments in time and other resources necessary to win those titles in the future, but the real payoffs will be tangible, undeniable increases in the combat capability and the deterrent value of our conventional ground forces--if we push the competition in that direction. The competing NATO countries should work closely together to make the modifications to the competition that will most closely simulate real combat.

Excellence Achieved--Keep Pushing

The 1980's have seen the publication of several widely read books regarding the pursuit of excellence. The first, and perhaps most noteworthy, was In Search of Excellence , by Thomas J. Peters and Robert H. Waterman. Published in 1982 during an apparently hopeless decline of America's competitive position in the business world and at the tail end of a severe U.S. business recession, In Search asserted that American business was not dead --indeed, it said there were many very successful American corporations. The authors described the common characteristics that made them successful. This book, and its sequel, A Passion for Excellence , by Tom Peters, are credited with reviving the confidence of American management. In June 1986, the President's Blue Ribbon Panel on Defense Management published its findings and recommendations regarding how to improve the management of the nation's defense. Entitled A Quest for Excellence , the President's panel proposed organizational and philosophical changes that could lead to excellence in defense management. Encouragement of innovation in a competitive environment was a major theme.

In harmony with that theme, the American Army victory in the 1987 Canadian Army Trophy Competition is the story of excellence achieved, and victory that did not come easily or quickly. Other victories will be even more difficult in the future. But a close look at the ingredients that led to the CAT '87 win shows much of the substance that yields excellence. In compiling this account of the American effort, I have tried to give our leadership a look at the winning ingredients in hopes that they will continue the push for excellence in the future.

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